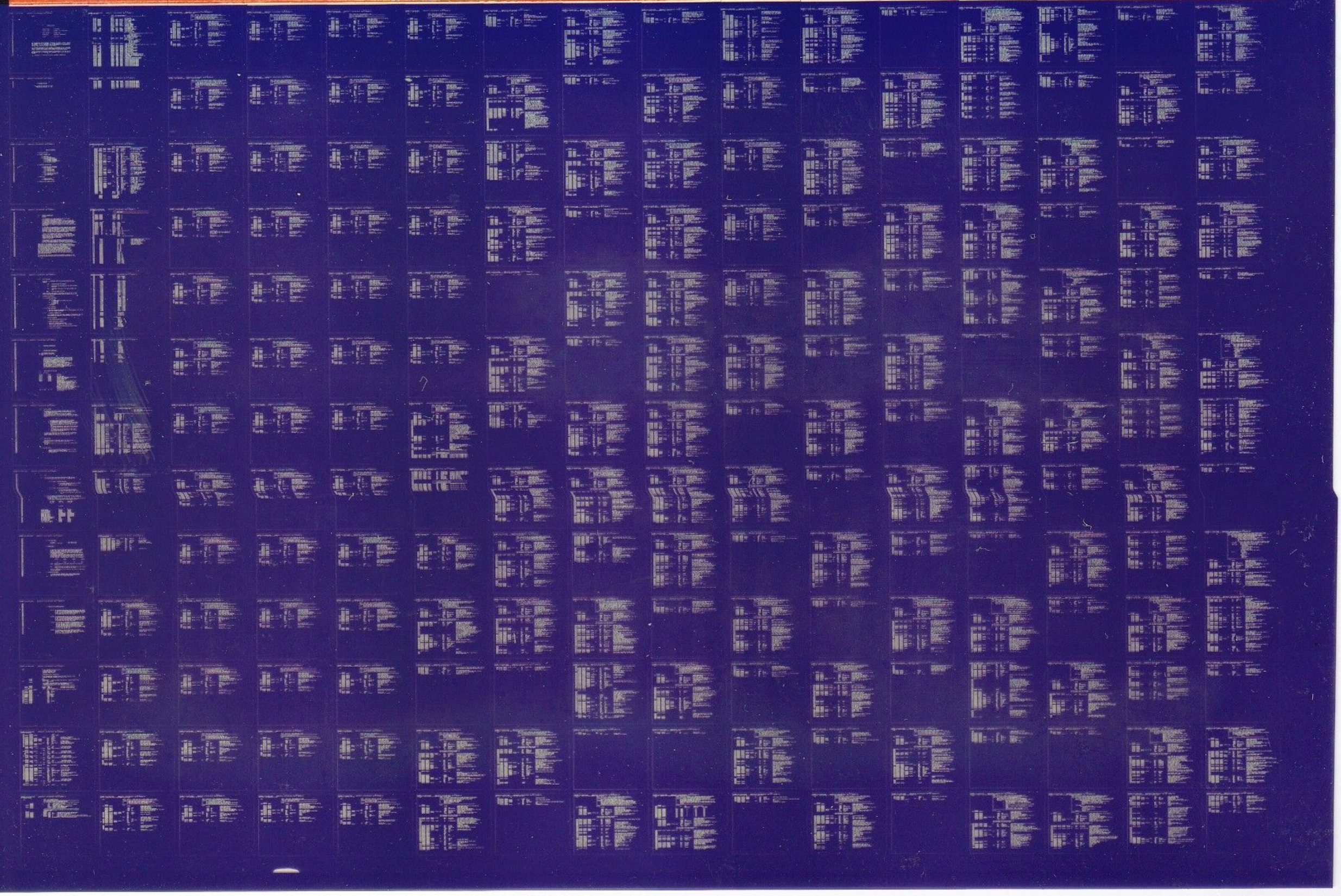
KK11-B

11/44 KK11B CACHE
CKKKAB0

AH-F626B-MC
FICHE 1 OF 2



KK11-B

11/44 KK11B CACHE
CKKKAB0

AH-F626B-MC
FICHE 2 OF 2

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.REM %
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IDENTIFICATION

PRODUCT CODE:	AC-F624B-MC
PRODUCT NAME:	CKKKAB0 11/44 KK11B CACHE
DATE CREATED:	OCTOBER 1980
MAINTAINER:	DIAGNOSTIC ENGINEERING
AUTHOR:	JOHN CIUKAJ

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                                1.0 HISTORY SECTION
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                                CKKKAA0 WAS RELEASED OCT 1979
                                CKKKAB0 WAS RELEASED OCT 1980
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2.0 GENERAL PROGRAM INFO

2.1 ABSTRACT

THIS DIAGNOSTIC IS A LOGIC TEST OF THE 11/44 CACHE .
IT IS APT,ACT11,AND XXDP COMPATIBLE.
THIS DIAGNOSTIC ASSOCIATES A GROUP OF TESTS WITH ONE AREA
OF CACHE LOGIC AND PROCEEDS TO TEST THAT AREA COMPREHENSIVELY.
THE MAINTENANCE FEATURES OFFERED BY THE 11/44 CACHE ALLOWS
INFORMATION TO BE READ IN KEY AREAS OF THE CACHE ALLOWING
THE DIAGNOSTIC TO ISOLATE FAILURES TO DATA PATHS ,AND IN SOME
CASES IC'S.

AT THE START OF THE DIAGNOSTIC, A SMALL AREA OF WRITE CONTROL
LOGIC AND THE MAINTENANCE FEATURES ARE ASSUMED TO BE WORKING.
SO EFFECTIVE ARE THE MAINTENANCE FEATURES THAT THE CACHE IS
COMPLETELY TURNED OFF (NO DATA IS ALLOWED TO BE CACHED OUT OF
THE CACHE) AT THE START OF THE DIAGNOSTIC AND NOT TURNED ON
UNTIL 90 PERCENT OF THE DIAGNOSTIC IS COMPLETE.

 TYPICAL TEST SEQUENCE FOR A BLOCK OF LOGIC CONTAINING
RAM IC'S IS TO FIRST VERIFY DATA PATHS TO ONE RAM LOCATION,
VERIFY THAT 0'S AND 1'S CAN BE WRITTEN TO ALL RAM LOCATIONS
,VERIFY ADDRESS LINES TO RAMS, AND FINALLY TO CHECK THE
INTEGRITY OF THE RAMS BY PERFORMING
A MARCH PATTERN TEST.

THE DIAGNOSTIC TESTS WERE DESIGNED IN ASSOCIATION WITH
A M7097 CACHE LOGIC SCHEMATIC. REFERENCE TO THIS DOCUMENT
WILL HELP THE UNDERSTANDING OF THE TEST SEQUENCING AND PURPOSE.

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 4K BUFFER IS RESERVED AT THE
END OF THE PROGRAM FOR READ WRITE OPERATIONS AND RELOCATION OF TESTS.

```
                2.2     TEST STRUCTURE

                        EACH TEST IS STRUCTURED WITH THE FOLLOWING DEDICATED LOCAL
                        SYMBOLS:

                                40$:    LOCATION WHERE TEST BEGINS

                                1$:     LOCATION OF THE BEGINNING OF THE LOOP ON ERROR
                                        CODE LOOP

                                25$:    LOCATION OF THE END OF THE LOOP ON ERROR CODE
                                        LOOP

                                10$:    LOCATION WHERE TEST ENDS

                        THESE LOCATIONS ARE USED BY THE $SCPSET ROUTINE TO SET UP LOOP
                        ON TEST AND LOOP ON ERROR VECTORS (REFER TO $SCPSET SECT. 9.0)

                2.3     HARDWARE REQUIREMENTS

                        2.3.1 REQUIRED EQUIPMENT

                                1. PDP11-44 CPU
                                        A. M7094/M7095 CPU CONTROL DATA PATH
                                        B. M7096 MFM
                                        C. M7098 UBI
                                        D. M7090 CIM
                                2.  16K MEMORY

                                3. I/O TERMINAL

                2.3.2 OPTIONAL EQUIPMENT

                                1. RMI REGISTER(G5179) HARDWARE FOR HI ORDER ADDRESS LINE TESTING
                                2. PDP11 CPU UNIBUS EXERCISER

                2.3.3     DIAGNOSTIC PREREQUISITES

                        IT IS ASSUMED THAT ALL THE ABOVE HARDWARE IS OPERATIONAL AND THAT
                        THERE RESPECTIVE DIAGNOSTICS HAVE BEEN RUN FOR VERIFICATION.

                2.3.4   RELATED DOCUMENTS

                                1. 11/44 CACHE DESIGN SPECIFICATION

                                2. M7097 CACHE LOGIC SCHEMATIC

                                3. RMI(G5179) REGISTER DESCRIPTION
                                   DATED 29 JAN 1979-PDP11 SYS. PROD. SUPPORT

                                4. PMK05 UNIBUS EXERCISER OPERATING AND SERVICE MANUAL

                                5. CFKKAA 11/34 DIAGNOSTIC
```

3.0 OPERATING INSTRUCTIONS

3.1 LOAD AND START PROCEDURE

1. LOAD PROGRAM INTO MEMORY
2. LOAD STARTING ADDRESS 200
3. START

LOADING AND STARTING AT 200 IS NORMAL LOGIC TESTING. THE FIRST PASS IS A QUICK VERIFY PASS FOLLOWED BY AN ENDPASS PRINTOUT. SUBSEQUENT EXECUTION OF THE PROGRAM WILL RESULT IN REPEATED PASSES SPECIFIED BY LOCATION $TIMES BEFORE ENDPASS IS PRINTED AGAIN.
ALL ERRORS ARE ACCOMPANIED BY AN ERROR PRINTOUT CONSISTING OF A MINIMUM OF THE FAILING TEST (TESTNO) AND THE LOCATION IN THE PROGRAM WHERE THE ERROR OCCURED (ERRPC). IT IS NECESSARY FOR THE USER TO REFER TO THE ASSEMBLED LISTING AT THE LOCATION SPECIFIED BY ERRPC FOR AN EXPLANATION OF THE ERROR.

3.2 SWITCH REGISTER OPTIONS

3.2.1 [OPTIONS]

SWITCH	OCTAL	FUNCTION
SW15=1	100000	HALT ON ERROR
SW14=1	040000	LOOP ON TEST SPECIFIED IN SW07:SW00
SW13=1	020000	INHIBIT ERROR TYPEOUTS
SW11=1	004000	INHIBIT ITERATIONS
SW09=1	001000	LOOP ON ERROR
SW08=1	000400	DIAGNOSTIC WILL TEST TO VERIFY THAT INVALIDATION WILL OCCUR DUE TO A READ HIT BYPASS CONDITION: DIAGNOSTIC ASSUMES PHYSICAL STRAP W2 IS IN. IF SW08=0 THEN DIAGNOSTIC TESTS TO VERIFY THAT NO INVALIDATION WILL OCCUR DUE TO A READ HIT BYPASS CONDITION. DIAGNOSTIC,IN THIS CASE, ASSUMES PHYSICAL STRAP W1 IS IN PLACE.
SW07 TO SW00	001-377	SPECIFIES TEST WHEN LOOP ON TEST IS SELECTED(SW14)

3.2.2 LOOP ON ERROR

THE INTENT OF THE LOOP ON ERROR FEATURE (SW09) IS TO GET
A TIGHT CODING LOOP TO OCCUR WHEN AN ERROR HAPPENS TO AID
IN ISOLATING THE FAILURE.
THE FOLLOWING IS A DESCRIPTION OF HOW THE PROGRAM
HANDLES LOOP ON ERROR. FOR THIS EXAMPLE ASSUME THAT THE TEST
HAS BEEN RELOCATED TO HI CACHE BUFFER AREA STARTING AT ADDRESS
70000.

1. AN ERROR OCCURS SO $ERROR ROUTINE IS ENTERED
2. THE APPROPRIATE ERROR MESSAGE IS PRINTED
3. AN APPROPRIATE 'JMP 1$' INSTRUCION IS AUTOMATICALLY
   WRITTEN BY THE PROGRAM TO THE LOCATION IN HI CACHE
   BUFFER AREA LOCATION SPECIFIED BY 25$ FOR THIS
   TEST.
4. THE $ERROR ROUTINE WILL THEN JUMP TO THE LOCATION
   IN HI CACHE BUFFER AREA SPECIFIED BY 1$ FOR THIS
   TEST.
5. THE PROGRAM WILL NOW BE EXECUTING A CODE LOOP
   IN HI CACHE BUFFER AREA BOUNDED BY THE LOCATIONS
   SPECIFIED BY 1$ AND 25$.

TO CLEAR THIS CONDITION THE CPU MUST BE HALTED FOLLOWED BY
LOADING ADDRESS 200 AND START.IF SW09 BIT IS CLEARED THEN
NORMAL PROGRAM EXECUTION WILL HAVE BEEN RESUMED.

3.2.3 LOOP ON TEST

WHEN LOOP ON TEST IS SELECTED (SW14) THE TEST SPECIFIED
BY BITS 7:0 IN THE SWITCH REGISTER IS EXECUTED
REPEATEDLY.
THE TEST IS LOOPED IN ITS ENTIRETY ,UNLIKE THE LOOP ON ERROR
FEATURE.

3.2.4 IMPLEMENTATION

SELECT SWITCH REGISTER OPTIONS BY USING 11/44 MFM
CONSOLE. TYPE ^P TO ENTER CONSOLE.
NORMAL OPERATION IS TO RUN WITH ALL SWITCH REGISTER
BITS EQUAL TO 0.

3.3 APT

3.3.1 THE FOLLOWING APT USER SWITCH REGISTER BITS ARE DEFINED FOR THIS DIAGNOSTIC AND ARE VALID ONLY IF $ENVM BIT 7=1:

BIT 12 $USWR (UNIBUS EXERCISER)

=1 APT SAYS PDP11 UNIBUS EXERCISER IS PRESENT SO PERFORM DMA TESTS.

=0 APT SAYS DO NOT PERFORM DMA TESTS.

BIT 7 $USWR (RMI REGISTER (G5179))

=1 APT SAYS RMI REGISTER IS PRESENT PERFORM HI ORDER ADDRESS LINE TESTS

=0 APT SAYS DO NOT PERFORM HI ORDER ADDR. LINE TESTS.

3.3.2 THE FOLLOWING IS A PROGRAM LOAD FILE USED BY APT. E TABLE 'A' IS USED FOR APT DUMP MODE AND E TABLE 'B' IS USED FOR APT QV AND RUN TIME MODE.
E TABLE 'B' IS SET UP TO RUN RMI REGISTER TESTS AND UNIBUS EXERCISER TESTS,INHIBIT ITERATIONS, AND SUPPRESS ERROR TYPEOUTS.

1ST PASS RUN TIME	LONGEST TEST TIME	ADDITIONAL RUN TIME
10	5	0

.....	E TABLES	.....
	A	B
E-MODE/S-MODE	200/000	240/001
SWITCH REGISTER 1	004000	004000
SWITCH REGISTER 2	010200	010200
CPU TYPE/OPTIONS	00/0000	00/0000
MEMORY MAP CODE 1	000/00000000	000/00000000
MEMORY MAP CODE 2	000/00000000	000/00000000
MEMORY MAP CODE 3	000/00000000	000/00000000
MEMORY MAP CODE 4	000/00000000	000/00000000
BUS PRIORITY/INTERRUPT 1	0000	0000
BUS PRIORITY/INTERRUPT 2	0000	0000
BUS ADDRESS CODE	000000	000000
DEVICE MAP CODE	000000	000000
CTLR. SPECIFIC WORD 1	000000	000000
CTLR. SPECIFIC WORD 2	000000	000000

```
345
346
347                                3.4 EXECUTION TIMES
348
349                                        1ST PASS:                       LESS THAN 10 SEC.
350                                        PASSES WITH ITERATIONS:         LESS THAN 75 SEC.
351
352
353                                4.0 ERROR INFO
354                                   -------------
355
356
357                                4.1     IN ADDITION TO TESTNO AND ERRPC BEING PRINTED WHEN AN ERROR
358                                        OCCURS, ADDITIONAL INFORMATION CAN BE GIVEN DEPENDING ON
359                                        THE TEST. THE INFO. IS IN THE FORM OF DATA DESCRIBED IN A
360                                        FASHION WHICH RELATES TO THE LOGIC BEING TESTED AND CAN AID
361                                        IN ISOLATING THE FAILURE.
362                                        FOR EXAMPLE, A TEST MAY VERIFY THAT THE CACHE TAG STORE RAMS
363                                        CAN BE LOADED FROM THE CACHE ADDRESS LINES (CA<21:13>) AND
364                                        THEN BE READ FROM THE CACHE HIT REGISTER BITS 15:7 (CHR<15:7>).
365                                        AN ERROR PRINTOUT ,THEREFORE,WOULD  LOOK LIKE THE FOLLOWING:
366
367                                                TESTNO          ERRPC           CHR157          CA2113
368                                                ------          -----           -----           ------
369
370                                                   102          13234             001           000
371
372                                                WHERE:  CHR157 SPECIFIES DATA READ FROM CACHE HIT REGISTER
373                                                        BITS 15:7
374
375                                                AND     CA3113 SPECIFIES THE ADDRESS PATTERN ON THE CACHE ADDRESS
376                                                        LINES 21:13 USED TO LOAD THE TAG STORE
377
378                                                CA2113 IS ANALAGOUS TO 'DATA EXPECTED' AND CHR157 IS ANALAGOUS
379                                                TO 'DATA RECEIVED'.
380
381                                4.2 UNCONTROLLED ERRORS
382
383                                        IF AT ANY TIME THE PROGRAM STOPS WITHOUT PROPER ERROR
384                                        INDICATION EXAMINING LOCATION SPECIFIED BY $TESTN WILL
385                                        INDICATE WHAT TEST THE PROGRAM HAD REACHED.
```

5.0 HANDLERS AND COMMON ROUTINES

RELCTL: THIS ROUTINE,WHEN CALLED, WILL RELOCATE ALL TEST CODE
OF THE TEST UP TO AND INCLUDING THE LOCATION SPECIFIED
BY 10$: TO LOW CACHE BUFFER AREA BEGINNING AT LOCATION
60000. WHEN THIS HAS BEEN DONE THE ROUTINE WILL JUMP
TO LOCATION 60000 FOR TEST EXECUTION.

RELCTH: THIS ROUTINE,WHEN CALLED, WILL RELOCATE ALL TEST CODE
OF THE TEST UP TO AND INCLUDING THE LOCATION SPECIFIED
BY 10$: TO HIGH CACHE BUFFER AREA BEGINNING AT LOCATION
70000. WHEN THIS HAS BEEN DONE THE ROUTINE WILL JUMP
TO LOCATION 70000 FOR TEST EXECUTION.

$SCPSET: THIS ROUTINE IS PERFORMED AT THE BEGINNING OF EACH
TEST. IT SETS UP VECTORS TO ACCOMPLISH LOOP ON TEST
AND LOOP ON ERROR. THE LOCATIONS SPECIFIED BY 40$,
1$, AND 25$ ARE PASSED TO THE ROUTINE AND ARE
ADDRESS LOCATIONS WHICH ARE INDICATIVE OF WHERE THOSE
LOCATIONS WILL BE WHEN THE TEST IS RELOCATED TO EITHER
HI OR LO CACHE BUFFER AREA.

$ERROR: THIS ROUTINE IS CALLED WHEN THERE IS AN ERROR.
IT WILL ALWAYS TYPE FAILING TEST NUMBER AND FAILING
ERROR PC. IT MAY TYPE ADDITIONAL DATA INFO. DEPENDING
ON THE TEST (USES THE ARGUEMENTS PASSED BY
THE TEST TO THE ROUTINE).

```
                                        %
                                        .TITLE  CKKKAB0 11-44 KK11B CACHE
                                        ;*COPYRIGHT (C) OCT 1979
                                        ;*DIGITAL EQUIPMENT CORP.
                                        ;*MAYNARD, MASS. 01754
                                        ;*
                                        ;*PROGRAM BY DAN P. MILLEVILLE
                                        ;*
                                        ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
                                        ;*PACKAGE (MAINDEC-11-DZQAC-C3), JAN 19, 1977.
                                        ;*
                    000001              $TN=1
                    160000              $SWR=160000     ;;HALT ON ERROR, LOOP ON TEST, INHIBIT ERROR TYPOUT
                                        .SBTTL  TRAP CATCHER
                    000000                      .=0
                                        ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
                                        ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
                                        ;*LOCATION 0 CONTAIN 0 TO CATCH IMPROPERLY LOADED VECTORS
                    000174                      .=174
                    000174  000000      DISPREG: .WORD  0               ;;SOFTWARE DISPLAY REGISTER
                    000176  000000      SWREG:   .WORD  0               ;;SOFTWARE SWITCH REGISTER
                                        .SBTTL  STARTING ADDRESS(ES)
                    000200  000137  000200      JMP     @#200   ;;JUMP TO STARTING ADDRESS OF PROGRAM
                    000020                      .=20
                    000020  002144              .WORD   $SCPSET
                    000022  000340              .WORD   340
                    000030                      .=30
                    000030  045246              .WORD   $ERROR
                    000032  000340              .WORD   340
                    000034  045172              .WORD   $TRAP
                    000036  000340              .WORD   340
                    000042                      .=42
                    000042  000000              .WORD   0
                    000046                      .=46
                    000046  044146              .WORD   $ENDAD
                    000052                      .=52
                    000052  000000              .WORD   0
```

```
                000200                                  .=200
000200  000137  001000                                  JMP     START
                001000                                  .=1000
001000  000005                          START:         RESET                   ;DISABLE ALL INTERRUPTS
001002  012706  000500                                  MOV     #500,SP         ;SET STACK POINTER
001006  012737  001032  000004                          MOV     #4$,4           ;SETUP FOR POSSIBLE NEX MEMORY TRAP
001014  012737  000340  000006                          MOV     #340,6
001022  012737  001015  177746                          MOV     #OFF,CCR        ;DISABLE CACHE
001030  000536                                          BR      5$              ;NO TRAP;CONTINUE
001032  022626                                  4$:     CMP     (SP)+,(SP)+     ;ADJUST STACK DUE TO TRAP
001034  012737  000006  000004                          MOV     #6,4            ;RESTORE TRAP VECTORS
001042  005037  000006                                  CLR     6

001046  104401  001054                                  TYPE    ,65$            ;;TYPE ASCIZ STRING
001052  000416                                          BR      64$             ;;GET OVER THE ASCIZ
001054    200     103     113           65$:    .ASCIZ  <CRLF>/CKKKAB0 11-44 KK11B CACHE/
                                                .EVEN
001110                                  64$:
001110  104401  001116                                  TYPE    ,67$            ;;TYPE ASCIZ STRING
001114  000423                                          BR      66$             ;;GET OVER THE ASCIZ
001116    200     124     122           67$:    .ASCIZ  <CRLF>/TRAP THRU NEX MEMORY VECTOR OCCURED/
                                                .EVEN
001164                                  66$:
001164  104401  001172                                  TYPE    ,69$            ;;TYPE ASCIZ STRING
001170  000424                                          BR      68$             ;;GET OVER THE ASCIZ
001172    200     104     111           69$:    .ASCIZ  <CRLF>/DIAGNOSTIC ATTEMPTED TO TURN CACHE OFF/
                                                .EVEN
001242                                  68$:
001242  104401  001250                                  TYPE    ,71$            ;;TYPE ASCIZ STRING
001246  000423                                          BR      70$             ;;GET OVER THE ASCIZ
001250    200     102     131           71$:    .ASCIZ  <CRLF>/BY ADDRESSING CACHE CONTROL REGISTER/
                                                .EVEN
001316                                  70$:
001316  012737  000001  001466                          MOV     #1,$MSGTY       ;SET $MSGTY FOR POSSIBLE APT USE
001324  000000                                          HALT                    ;HALT PROGRAM

001326  012737  000006  000004          5$:     MOV     #6,4            ;RESTORE VECTORS
001334  005037  000006                          CLR     6
001340  005037  001474                          CLR     $PASS           ;CLEAR PASS COUNT
001344  132737  000200  001507                  BITB    #APTSIZE,$ENVM  ;IS APT SIZING?
001352  001403                                  BEQ     1$              ;NO
001354  012737  001510  002074                  MOV     #$SWREG,SWR     ;YES;USE APT SWITCH REGISTER
001362  005737  000042                  1$:     TST     42              ;IS THIS MANUAL MODE?
001366  001404                                  BEQ     3$              ;YES TYPE ID
001370  023737  000042  000046                  CMP     42,46           ;IS THIS ACT 11 QV OR AUTO MODE?
001376  001423                                  BEQ     2$              ;YES;SKIP TITLE
001400  000240                          3$:     NOP
001402  000240                                  NOP
001404  104401  001412                          TYPE    ,73$            ;;TYPE ASCIZ STRING
001410  000416                                  BR      72$             ;;GET OVER THE ASCIZ
001412    200     103     113           73$:    .ASCIZ  <CRLF>/CKKKAB0 11-44 KK11B CACHE /
                                                .EVEN
001446                                  72$:

001446  000137  002416                  2$:     JMP     BEGIN           ;START TEST
```

```
569                                     .SBTTL  APT PARAMETER BLOCK
                                        ;;**********************************************************************
                                        ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
                                        ;;**********************************************************************
                001452                          .$X=.   ;;SAVE CURRENT LOCATION
                000024                          .=24    ;;SET POWER FAIL TO POINT TO START OF PROGRAM
          000024 000200                         200     ;;FOR APT START UP
                000044                          .=44    ;;POINT TO APT INDIRECT ADDRESS PNTR.
          000044 001452                         $APTHDR ;;POINT TO APT HEADER BLOCK
                001452                          .=.$X   ;;RESET LOCATION COUNTER
                                        ;;**********************************************************************
                                        ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
                                        ;INTERFACE SPEC.
          001452                        $APTHD:
          001452 000000                 $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
          001454 001466                 $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
          001456 000005                 $TSTM:  .WORD   5       ;;RUN TIM OF LONGEST TEST
          001460 000010                 $PASTM: .WORD   10      ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
          001462 000000                 $UNITM: .WORD   0       ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
          001464 000052                         .WORD   $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
```

```
 571                                    .SBTTL  APT MAILBOX-ETABLE
                                        ;;**********************************************************************
                                        .EVEN
 001466                                 $MAIL:                          ;;APT MAILBOX
 001466  000000                         $MSGTY: .WORD   AMSGTY   ;;MESSAGE TYPE CODE
 001470  000000                         $FATAL: .WORD   AFATAL   ;;FATAL ERROR NUMBER
 001472  000000                         $TESTN: .WORD   ATESTN   ;;TEST NUMBER
 001474  000000                         $PASS:  .WORD   APASS    ;;PASS COUNT
 001476  000000                         $DEVCT: .WORD   ADEVCT   ;;DEVICE COUNT
 001500  000000                         $UNIT:  .WORD   AUNIT    ;;I/O UNIT NUMBER
 001502  000000                         $MSGAD: .WORD   AMSGAD   ;;MESSAGE ADDRESS
 001504  000000                         $MSGLG: .WORD   AMSGLG   ;;MESSAGE LENGTH
 001506                                 $ETABLE:                        ;;APT ENVIRONMENT TABLE
 001506     000                         $ENV:   .BYTE   AENV     ;;ENVIRONMENT BYTE
 001507     000                         $ENVM:  .BYTE   AENVM    ;;ENVIRONMENT MODE BITS
 001510  000000                         $SWREG: .WORD   ASWREG   ;;APT SWITCH REGISTER
 001512  000000                         $USWR:  .WORD   AUSWR    ;;USER SWITCHES
 001514  000000                         $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
 001516     000                         $MAMS1: .BYTE   AMAMS1   ;;HIGH ADDRESS,M.S. BYTE
 001517     000                         $MTYP1: .BYTE   AMTYP1   ;;MEM. TYPE,BLK#1
                                        ;*                              MEM.TYPE BYTE   --  (HIGH BYTE)
                                        ;*                                      900 NSEC CORE=001
                                        ;*                                      300 NSEC BIPOLAR=002
                                        ;*                                      500 NSEC MOS=003
 001520  000000                         $MADR1: .WORD   AMADR1   ;;HIGH ADDRESS,BLK#1
                                        ;*                                MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF "TYPE" ABOVE
 001522     000                         $MAMS2: .BYTE   AMAMS2   ;;HIGH ADDRESS,M.S. BYTE
 001523     000                         $MTYP2: .BYTE   AMTYP2   ;;MEM.TYPE,BLK#2
 001524  000000                         $MADR2: .WORD   AMADR2   ;;MEM.LAST ADDRESS,BLK#2
 001526     000                         $MAMS3: .BYTE   AMAMS3   ;;HIGH ADDRESS,M.S.BYTE
 001527     000                         $MTYP3: .BYTE   AMTYP3   ;;MEM.TYPE,BLK#3
 001530  000000                         $MADR3: .WORD   AMADR3   ;;MEM.LAST ADDRESS,BLK#3
 001532     000                         $MAMS4: .BYTE   AMAMS4   ;;HIGH ADDRESS,M.S.BYTE
 001533     000                         $MTYP4: .BYTE   AMTYP4   ;;MEM.TYPE,BLK#4
 001534  000000                         $MADR4: .WORD   AMADR4   ;;MEM.LAST ADDRESS,BLK#4
 001536  000000                         $VECT1: .WORD   AVECT1   ;;INTERRUPT VECTOR#1,BUS PRIORITY#1
 001540  000000                         $VECT2: .WORD   AVECT2   ;;INTERRUPT VECTOR#2BUS PRIORITY#2
 001542  000000                         $BASE:  .WORD   ABASE    ;;BASE ADDRESS OF EQUIPMENT UNDER TEST
 001544  000000                         $DEVM:  .WORD   ADEVM    ;;DEVICE MAP
 001546  000000                         $CDW1:  .WORD   ACDW1    ;;CONTROLLER DESCRIPTION WORD#1
 001550  000000                         $CDW2:  .WORD   ACDW2    ;;CONTROLLER DESCRIPTION WORD#2
 001552  000000                         $DDW0:  .WORD   ADDW0    ;;DEVICE DESCRIPTOR WORD#0
 001554  000000                         $DDW1:  .WORD   ADDW1    ;;DEVICE DESCRIPTOR WORD#1
 001556  000000                         $DDW2:  .WORD   ADDW2    ;;DEVICE DESCRIPTOR WORD#2
 001560  000000                         $DDW3:  .WORD   ADDW3    ;;DEVICE DESCRIPTOR WORD#3
 001562  000000                         $DDW4:  .WORD   ADDW4    ;;DEVICE DESCRIPTOR WORD#4
 001564  000000                         $DDW5:  .WORD   ADDW5    ;;DEVICE DESCRIPTOR WORD#5
 001566  000000                         $DDW6:  .WORD   ADDW6    ;;DEVICE DESCRIPTOR WORD#6
 001570  000000                         $DDW7:  .WORD   ADDW7    ;;DEVICE DESCRIPTOR WORD#7
```

```
001572  000000                  $DDW8:  .WORD   ADDW8   ;;DEVICE DESCRIPTOR WORD#8
001574  000000                  $DDW9:  .WORD   ADDW9   ;;DEVICE DESCRIPTOR WORD#9
001576  000000                  $DDW10: .WORD   ADDW10  ;;DEVICE DESCRIPTOR WORD#10
001600  000000                  $DDW11: .WORD   ADDW11  ;;DEVICE DESCRIPTOR WORD#11
001602  000000                  $DDW12: .WORD   ADDW12  ;;DEVICE DESCRIPTOR WORD#12
001604  000000                  $DDW13: .WORD   ADDW13  ;;DEVICE DESCRIPTOR WORD#13
001606  000000                  $DDW14: .WORD   ADDW14  ;;DEVICE DESCRIPTOR WORD#14
001610  000000                  $DDW15: .WORD   ADDW15  ;;DEVICE DESCRIPTOR WORD#15
001612                          $ETEND:
```

```
573                                     .SBTTL  APT COMMUNICATIONS ROUTINE
                                        ;;*****************************************************************
001612  112737  000001  002056  $ATY1:  MOVB    #1,$FFLG        ;;TO REPORT FATAL ERROR
001620  112737  000001  002054  $ATY3:  MOVB    #1,$MFLG        ;;TO TYPE A MESSAGE
001626  000403                         BR      $ATYC
001630  112737  000001  002056  $ATY4:  MOVB    #1,$FFLG        ;;TO ONLY REPORT FATAL ERROR
001636                         $ATYC:
001636  010046                         MOV     R0,-(SP)        ;;PUSH R0 ON STACK
001640  010146                         MOV     R1,-(SP)        ;;PUSH R1 ON STACK
001642  105737  002054                 TSTB    $MFLG           ;;SHOULD TYPE A MESSAGE?
001646  001450                         BEQ     5$              ;;IF NOT:  BR
001650  122737  000001  001506         CMPB    #APTENV,$ENV    ;;OPERATING UNDER APT?
001656  001031                         BNE     3$              ;;IF NOT:  BR
001660  132737  000100  001507         BITB    #APTSPOOL,$ENVM ;;SHOULD SPOOL MESSAGES?
001666  001425                         BEQ     3$              ;;IF NOT:  BR
001670  017600  000004                 MOV     @4(SP),R0       ;;GET MESSAGE ADDR.
001674  062766  000002  000004         ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
001702  005737  001466         1$:     TST     $MSGTYPE        ;;SEE IF DONE W/ LAST XMISSION?
001706  001375                         BNE     1$              ;;IF NOT:  WAIT
001710  010037  001502                 MOV     R0,$MSGAD       ;;PUT ADDR IN MAILBOX
001714  105720                 2$:     TSTB    (R0)+           ;;FIND END OF MESSAGE
001716  001376                         BNE     2$
001720  163700  001502                 SUB     $MSGAD,R0       ;;SUB START OF MESSAGE
001724  006200                         ASR     R0              ;;GET MESSAGE LNGTH IN WORDS
001726  010037  001504                 MOV     R0,$MSGLGT      ;;PUT LENGTH IN MAILBOX
001732  012737  000004  001466         MOV     #4,$MSGTYPE     ;;TELL APT TO TAKE MSG.
001740  000413                         BR      5$
001742  017637  000004  001766  3$:     MOV     @4(SP),4$       ;;PUT MSG ADDR IN JSR LINKAGE
001750  062766  000002  000004         ADD     #2,4(SP)                ;;BUMP RETURN ADDRESS
001756  013746  177776                 MOV     177776,-(SP)    ;;PUSH 177776 ON STACK
001762  004737  044166                 JSR     PC,$TYPE        ;;CALL TYPE MACRO
001766  000000                 4$:     .WORD   0
001770                         5$:
001770  105737  002056         10$:    TSTB    $FFLG           ;;SHOULD REPORT FATAL ERROR?
001774  001416                         BEQ     12$             ;;IF NOT:  BR
001776  005737  001506                 TST     $ENV            ;;RUNNING UNDER APT?
002002  001413                         BEQ     12$             ;;IF NOT:  BR
002004  005737  001466         11$:    TST     $MSGTYPE        ;;FINISHED LAST MESSAGE?
002010  001375                         BNE     11$             ;;IF NOT:  WAIT
002012  017637  000004  001470         MOV     @4(SP),$FATAL   ;;GET ERROR #
002020  062766  000002  000004         ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
002026  005237  001466                 INC     $MSGTYPE        ;;TELL APT TO TAKE ERROR
002032  105037  002056         12$:    CLRB    $FFLG           ;;CLEAR FATAL FLAG
002036  105037  002055                 CLRB    $LFLG           ;;CLEAR LOG FLAG
002042  105037  002054                 CLRB    $MFLG           ;;CLEAR MESSAGE FLAG
002046  012601                         MOV     (SP)+,R1        ;;POP STACK INTO R1
002050  012600                         MOV     (SP)+,R0        ;;POP STACK INTO R0
002052  000207                         RTS     PC              ;;RETURN
002054     000         $MFLG:  .BYTE   0               ;;MESSG. FLAG
002055     000         $LFLG:  .BYTE   0               ;;LOG FLAG
002056     000         $FFLG:  .BYTE   0               ;;FATAL FLAG
                               .EVEN
            000200  APTSIZE=200
            000001  APTENV=001
            000100  APTSPOOL=100
            000040  APTCSUP=040
```

```
                                        ;;*****************************************************************
                                        ;       USER LABELS
                                        ;;*****************************************************************

002060  000000                  $TSTNM: .WORD   0
002062  000000                  LOOP:   .WORD   0
002064  000000                  CMRPAT: .WORD   0
002066  000000                  CHRPAT: .WORD   0
002070  000000                  FAIL1:  .WORD   0
002072  000000                  FAIL2:  .WORD   0


002074  177570                  SWR:    .WORD   177570
002076  177560                  $TKS:   177560
002100  177562                  $TKB:   177562
002102  177564                  $TPS:   177564
002104  177566                  $TPB:   177566
002106     000                  $NULL:  .BYTE   0
002107     002                  $FILLS: .BYTE   2
002110     012                  $FILLC: .BYTE   12
002111     000                  $TPFLG: .BYTE   0
002112     207      377     377 $BELL:  .ASCIZ  <207><377><377>
002116     077                  $QUES:  .ASCII  /?/
002117     015                  $CRLF:  .ASCII  <15>
002120     012      000         $LF:    .ASCIZ  <12>
002122     377      377     000 $ENULL: .BYTE   -1,-1,0
                                        .EVEN
                                        .SBTTL   REGISTER DEFINITIONS


177744                          CME = 177744            ;CACHE MEMORY PARITY FAULT REGISTER
177746                          CCR = 177746            ;CACHE CONTROL REGISTER
177750                          CMR = 177750            ;CACHE MAINTENANCE REGISTER
177752                          CHR = 177752            ;CACHE HIT REGISTER
177754                          CDR = 177754            ;CACHE DATA REGISTER
177776                          PSW = 177776            ;PROCESSER STATUS WORD
000000                          R0 = %0                 ;GENERAL REGISTERS
000001                          R1 = %1
000002                          R2 = %2
000003                          R3 = %3
000004                          R4 = %4
000005                          R5 = %5
000006                          SP = %6
000007                          PC = %7
000001                          BIT00 = 1
000002                          BIT01 = 2
000004                          BIT02 = 4
000010                          BIT03 = 10
000020                          BIT04 = 20
000040                          BIT05 = 40
000100                          BIT06 = 100
000200                          BIT07 = 200
000400                          BIT08 = 400
001000                          BIT09 = 1000
002000                          BIT10 = 2000
004000                          BIT11 = 4000
010000                          BIT12 = 10000
```

```
REGISTER DEFINITIONS
     632          020000                    BIT13 = 20000
     633          040000                    BIT14 = 40000
     634          100000                    BIT15 = 100000
     635
     636
     637          172300                    KPDR0 = 172300
     638          172302                    KPDR1 = 172302
     639          172304                    KPDR2 = 172304
     640          172306                    KPDR3 = 172306
     641          172310                    KPDR4 = 172310
     642          172312                    KPDR5 = 172312
     643          172314                    KPDR6 = 172314
     644          172316                    KPDR7 = 172316
     645          172340                    KPAR0 = 172340
     646          172342                    KPAR1 = 172342
     647          172344                    KPAR2 = 172344
     648          172346                    KPAR3 = 172346
     649          172350                    KPAR4 = 172350
     650          172352                    KPAR5 = 172352
     651          172354                    KPAR6 = 172354
     652          172356                    KPAR7 = 172356
     653          177572                    SR0   = 177572
     654          172516                    SR3   = 172516
     655          170200                    UMPR00= 170200
     656          170202                    UMPR01= 170202
     657          170204                    UMPR02= 170204
     658          170206                    UMPR03= 170206
     659          170210                    UMPR04= 170210
     660          170212                    UMPR05= 170212
     661          170214                    UMPR06= 170214
     662          170216                    UMPR07= 170216
     663          170220                    UMPR08= 170220
     664          170222                    UMPR09= 170222
     665          170002                    BECC  = 170002
     666          170004                    BEBA  = 170004
     667          170000                    BEDA  = 170000
     668          170006                    BECR1 = 170006
     669          170016                    BECR2 = 170016
     670
     671          000200                    APTSIZE=200
     672          000001                    APTENV=001
     673          000100                    APTSPOOL=100
     674          000040                    APTCSUP=040
     675
     676                               ;CCR REGISTER
     677          000001                    DCPI=1
     678          000004                    FMLO=4
     679          000010                    FMHI=10
     680          000100                    WWPD=100
     681          000200                    PEA=200
     682          000400                    FC=400
     683          001000                    UCB=1000
     684          002000                    WWPT=2000
     685          010000                    VCIP=10000
     686          020000                    VSIU=20000
     687
     688                               ;CMR REGISTER
```

REGISTER DEFINITIONS

```
     689          000001                          TDAR=1
     690          000002                          HODO=2
     691          000004                          EHA=4
     692          000010                          AM=10
     693          000020                          ESA=20
     694          000400                          HIT=400
     695          001000                          TPB=1000
     696          002000                          LPB=2000
     697          004000                          HPB=4000
     698          010000                          VLD=10000
     699          020000                          CM3=20000
     700          040000                          CM2=40000
     701          100000                          CM1=100000
     702
     703                                  ;CME REGISTER
     704          000040                          TPE=40
     705          000100                          PELO=100
     706          000200                          PEHI=200
     707          100000                          CMPE=100000
     708
     709          000001                          TSTID=1
     710          000004                          SCPCND=4
     711          001015                          OFF=1015
```

```
                                        ;;*****************************************************************
                                        ;       SETUP TEST CONDITIONS:
                                        ;                               1. TEST ITERATIONS
                                        ;                               2. LOAD TEST VECTORS FOR LOOP ON TEST,
                                        ;                                  LOOP ON ERROR
                                        ;
                                        ;;*****************************************************************
002126  000000                          STRTST: .WORD   0
002130  000000                          STRTLP: .WORD   0
002132  000000                          ADRSYNC: .WORD  0
002134  000000                          ADRJMP: .WORD   0
002136  000000                          ADR1$:  .WORD   0
002140  000000                          TSTCNT: .WORD   0
002142  000001                          TSTIMS: .WORD   1.


002144  012737  000340  177776  $SCPSET:MOV     #340,PSW        ;CPU HI PRIORITY
002152  113737  001472  002060          MOVB    $TESTN,$TSTNM   ;MOVE TEST NUMBER TO $TSTNM
002160  022737  000001  001472          CMP     #1,$TESTN       ;IS THIS TEST 1?
002166  001434                          BEQ     3$              ;YES,DO NOT CONSIDER LOOP ON TEST
002170  032777  040000  177676          BIT     #BIT14,@SWR     ;LOOP ON TEST?
002176  001413                          BEQ     4$              ;NO
002200  013702  001472                  MOV     $TESTN,R2       ;GET PRESENT TEST NUMBER
002204  005302                          DEC     R2              ;GET LAST TEST NUMBER
002206  120277  177662                  CMPB    R2,@SWR         ;IS THIS THE TEST?
002212  001005                          BNE     4$              ;NO
002214  005337  001472          5$:     DEC     $TESTN          ;YES;PREPARE FOR LOOP ON TEST
002220  013716  002126                  MOV     STRTST,(SP)     ;FUDGE RETURN
002224  000002                          RTI                     ;GO LOOP ON TEST
002226  005737  001474          4$:     TST     $PASS           ;FIRST PASS?
002232  001412                          BEQ     3$              ;YES;INHIBIT TEST ITERATIONS
002234  032777  004000  177632          BIT     #BIT11,@SWR     ;INHIBIT ITERATIONS?
002242  001006                          BNE     3$              ;YES
002244  005237  002140                  INC     TSTCNT          ;INCREMENT TEST ITERATION COUNTER
002250  023737  002142  002140          CMP     TSTIMS,TSTCNT   ;ITERATIONS COMPLETE?
002256  001356                          BNE     5$              ;NO CONTINUE WITH TEST
002260  005037  002140          3$:     CLR     TSTCNT
002264  011601                          MOV     (SP),R1         ;GET ADDRESS OF FIRST ARGUEMENT
002266  012137  002126                  MOV     (R1)+,STRTST    ;LOCATION OF START OF TEST
002272  012137  002130                  MOV     (R1)+,STRTLP    ;LOCATION OF START OF SCOPE LOOP
002276  012137  002132                  MOV     (R1)+,ADRSYNC   ;ADDRESS LOADED INTO AMR FOR SCOPE SYNC
002302  012137  002134                  MOV     (R1)+,ADRJMP    ;ADDRESS OF END OF SCOPE LOOP AND
                                                                ;WHERE 'JMP' IS WRITTEN
002306  013737  002134  002136          MOV     ADRJMP,ADR1$    ;
002314  062737  000002  002136          ADD     #2,ADR1$        ;LOCATION WHERE '1$' IS WRITTEN
002322  012777  000240  177604          MOV     #240,@ADRJMP    ;INITIALIZE SCOPE LOCATIONS
002330  012777  000240  177600          MOV     #240,@ADR1$
002336  010116                          MOV     R1,(SP)         ;SETUP STACK FOR RETURN
002340  000002                          RTI
```

```
                                .SBTTL  RELOCATION HANDLERS
                        ;;**************************************************************
                        ;               RELOCATION HANDLERS
                        ;;**************************************************************


002342  012701  060000  RELCTL: MOV     #LOW1,R1        ;START OF LOW SPACE
002346  012402                 MOV     (R4)+,R2        ;END OF MOVE
002350  012421          1$:    MOV     (R4)+,(R1)+     ;TRANSFER TEST
002352  020402                 CMP     R4,R2           ;PROCEED TO STOP MARK
002354  001375                 BNE     1$
002356  013721  002366         MOV     2$,(R1)+        ;RETURN INSTRUCTION
002362  000137  060000         JMP     60000           ;START TESTS
002366  000204          2$:    RTS     R4
002370  012701  070000  RELCTH: MOV     #HIGH1,R1       ;START OF HI SPACE
002374  012402                 MOV     (R4)+,R2        ;END OF MOVE
002376  012421          1$:    MOV     (R4)+,(R1)+     ;TRANSFER TEST
002400  020402                 CMP     R4,R2           ;PROCEED TO STOP MARK
002402  001375                 BNE     1$
002404  013721  002414         MOV     2$,(R1)+        ;RETURN INSTRUCTION
002410  000137  070000         JMP     70000           ;START TESTS
002414  000204          2$:    RTS     R4
```

```
    784 002416  012706  000500          BEGIN:  MOV     #500,SP         ;SET UP STACK
    785 002422  000005                          RESET
    786 002424  012737  000340  177776          MOV     #340,PSW        ;CPU HI PRIORITY
    787 002432  012737  001015  177746          MOV     #OFF,CCR        ;DISABLE CACHE
    788 002440  005037  001472                  CLR     $TESTN          ;RESET TEST ID COUNTER
    789 002444  012737  000002  000000          MOV     #2,0            ;INITIALIZE A FEW VECTORS
    790 002452  005037  000002                  CLR     2
    791 002456  012737  000006  000004          MOV     #6,4
    792 002464  005037  000006                  CLR     6
    793 002470  012737  000116  000114          MOV     #116,114
    794 002476  005037  000116                  CLR     116
    795 002502  005037  002062                  CLR     LOOP            ;SOFTWARE DELAY
    796 002506  005337  002062          1$:     DEC     LOOP
    797 002512  001375                          BNE     1$
```

```
802                                     .SBTTL  TEST # 1 - CACHE REGISTER RESPONSE TESTS
                                        ;;*****************************************************************
                                        ;*TEST 1 - CACHE REGISTER RESPONSE TESTS
                                        ;*      ATTEMPT READ INTO CME TO TEST ADDRESS SELECT LOGIC
                                        ;*      IF TIME OUT OCCURES THEN LOGIC IN FAULT
                                        ;;*****************************************************************
    002514                              TST1:
803 002514  000004                              SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
    002516  002526                              .WORD   40$             ;TEST START LOCATION
    002520  002526                              .WORD   1$              ;LOOP ON ERROR START LOCATION
    002522  000000                              .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
    002524  002552                              .WORD   25$             ;LOOP ON ERROR END LOCATION
    002526                              40$:
804 002526  012737  002560  000004     1$:     MOV     #2$,4           ;SETUP TRAP VECTOR
805 002534  012737  000340  000006             MOV     #340,6
806 002542  005737  177744                      TST     CME             ;READ PARITY REGISTER
807 002546  000240                              NOP
808 002550  000240                              NOP
809 002552  000240                      25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
    002554  000240                              NOP                     ;FOR  LOOP ON ERROR
810 002556  000411                              BR      10$             ;NO FAULT;GO TO NEXT TEST
811 002560  022626                      2$:     CMP     (SP)+,(SP)+     ;READJUST STACK DUE TO INTERRUPT
812 002562  012737  000006  000004             MOV     #6,4            ;RESTORE TRAP VECTOR
813 002570  005037  000006                      CLR     6
814 002574  104406                              ERROR                   ;ERROR
                                                                        ;-----
    002576  002574                              .WORD   .-2
815                                                                     ;CACHE REGISTER RESPONSE TESTS
816                                                                     ;READING PARITY FAULT REGISTER
817                                                                     ;CAUSED TIMEOUT
818
819 002600  000000                              .WORD   0
820 002602  000240                      10$:    NOP                     ;END OF TEST
    002604  005237  001472                      INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 2 - READ CCR TO CHECK ADDRESS SELECT LOGIC
                                ;;*********************************************************************
                                ;*TEST 2 - READ CCR TO CHECK ADDRESS SELECT LOGIC
                                ;*      ATTEMPT READ INTO CCR TO CHECK ADDRESS SELECT LOGIC
                                ;*      IF TIME OUT OCCURES THEN LOGIC IN FAULT
                                ;;*********************************************************************
    002610                      TST2:
826 002610  000004                      SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                ;ERROR/LOOP ON TEST
    002612  002622                      .WORD   40$             ;TEST START LOCATION
    002614  002622                      .WORD   1$              ;LOOP ON ERROR START LOCATION
    002616  000000                      .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
    002620  002646                      .WORD   25$             ;LOOP ON ERROR END LOCATION
    002622                      40$:
827 002622  012737  002654  000004 1$:  MOV     #2$,4           ;SETUP TRAP VECTOR
828 002630  012737  000340  000006      MOV     #340,6
829 002636  005737  177746              TST     CCR             ;READ CACHE CONTROL REGISTER
830 002642  000240                      NOP
831 002644  000240                      NOP
832 002646  000240              25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
    002650  000240                      NOP                     ;FOR  LOOP ON ERROR
833 002652  000411                      BR      10$             ;NO FAULT;GO TO NEXT TEST
834 002654  022626              2$:     CMP     (SP)+,(SP)+     ;READJUST STACK DUE TO INTERRUPT
835 002656  012737  000006  000004      MOV     #6,4            ;RESTORE TRAP VECTOR
836 002664  005037  000006              CLR     6
837 002670  104406                      ERROR                   ;ERROR
                                                                ;-----
    002672  002670                      .WORD   .-2
838                                                             ;CACHE REGISTER RESPONSE TESTS
839                                                             ;READING CACHE CONTROL REGISTER
840                                                             ;CAUSED TIMEOUT
841
842 002674  000000                      .WORD   0
843 002676  000240              10$:    NOP                     ;END OF TEST
    002700  005237  001472              INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 3 - READ CMR TO CHECK ADDRESS SELECT LOGIC
                                ;;*********************************************************************
                                ;*TEST 3 - READ CMR TO CHECK ADDRESS SELECT LOGIC
                                ;*      ATTEMPT READ INTO CMR TO  CHECK ADDRESS SELECT LOGIC
                                ;*      IF TIME OCCURES THEN LOGIC IN FAULT
                                ;;*********************************************************************
    002704                      TST3:
849 002704  000004                      SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                ;ERROR/LOOP ON TEST
    002706  002716                      .WORD   40$             ;TEST START LOCATION
    002710  002716                      .WORD   1$              ;LOOP ON ERROR START LOCATION
    002712  000000                      .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
    002714  002742                      .WORD   25$             ;LOOP ON ERROR END LOCATION
    002716                      40$:
850 002716  012737  002750  000004 1$:  MOV     #2$,4           ;SETUP TRAP VECTOR
851 002724  012737  000340  000006      MOV     #340,6
852 002732  005737  177750              TST     CMR             ;READ MAINTENANCE REGISTER
853 002736  000240                      NOP
854 002740  000240                      NOP
855 002742  000240              25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
    002744  000240                      NOP                     ;FOR  LOOP ON ERROR
856 002746  000411                      BR      10$             ;NO FAULT;GO TO NEXT TEST
857 002750  022626              2$:     CMP     (SP)+,(SP)+     ;READJUST STACK DUE TO INTERRUPT
858 002752  012737  000006  000004      MOV     #6,4            ;RESTORE TRAP VECTOR
859 002760  005037  000006              CLR     6
860 002764  104406                      ERROR                   ;ERROR
                                                                ;-----
    002766  002764                      .WORD   .-2
861                                                             ;CACHE REGISTER RESPONSE TESTS
862                                                             ;READING MAINTENANCE REGISTER
863                                                             ;CAUSED TIMEOUT
864 002770  000000                      .WORD   0
865 002772  000240              10$:    NOP                     ;END OF TEST
    002774  005237  001472              INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                        .SBTTL  TEST # 4 - READ INTO CHR TO CHECK ADDRESS SELECT LOGIC
                                        ;;*****************************************************************
                                        ;*TEST 4 - READ INTO CHR TO CHECK ADDRESS SELECT LOGIC
                                        ;*      ATTEMPT READ INTO CHR TO CHECK ADDRESS SELECT LOGIC
                                        ;*      IF TIME OUT OCCURES THEN LOGIC IN FAULT
                                        ;;*****************************************************************
    003000                              TST4:
871 003000  000004                              SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
    003002  003012                              .WORD   40$             ;TEST START LOCATION
    003004  003012                              .WORD   1$              ;LOOP ON ERROR START LOCATION
    003006  000000                              .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
    003010  003036                              .WORD   25$             ;LOOP ON ERROR END LOCATION
    003012                              40$:
872 003012  012737  003044  000004      1$:     MOV     #2$,4           ;SETUP TRAP VECTOR
873 003020  012737  000340  000006              MOV     #340,6
874 003026  005737  177752                      TST     CHR             ;READ HIT REGISTER
875 003032  000240                              NOP
876 003034  000240                              NOP
877 003036  000240                      25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
    003040  000240                              NOP                     ;FOR  LOOP ON ERROR
878 003042  000411                              BR      10$             ;NO FAULT;GO TO NEXT TEST
879 003044  022626                      2$:     CMP     (SP)+,(SP)+     ;READJUST STACK DUE TO INTERRUPT
880 003046  012737  000006  000004              MOV     #6,4            ;RESTORE TRAP VECTOR
881 003054  005037  000006                      CLR     6
882 003060  104406                              ERROR                   ;ERROR
                                                                        ;-----
    003062  003060                              .WORD   .-2
883                                                                     ;CACHE REGISTER RESPONSE TESTS
884                                                                     ;READING HIT REGISTER
885                                                                     ;CAUSED TIMEOUT
886 003064  000000                              .WORD   0
887 003066  000240                      10$:    NOP                     ;END OF TEST
    003070  005237  001472                      INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 5 - READ CDR TO CHECK ADDRESS SELECT LOGIC
                                ;;*****************************************************************
                                ;*TEST 5 - READ CDR TO CHECK ADDRESS SELECT LOGIC
                                ;*      ATTEMPT READ INTO CDR TO CHECK ADDRESS SELECT LOGIC
                                ;*      IF TIMEOUT OCCURS THEN LOGIC IN FAULT
                                ;;*****************************************************************
    003074                      TST5:
893 003074  000004                  SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                            ;ERROR/LOOP ON TEST
    003076  003106                  .WORD   40$             ;TEST START LOCATION
    003100  003106                  .WORD   1$              ;LOOP ON ERROR START LOCATION
    003102  000000                  .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
    003104  003132                  .WORD   25$             ;LOOP ON ERROR END LOCATION
    003106                      40$:
894 003106  012737  003140  000004 1$:     MOV     #2$,4           ;SETUP TRAP VECTOR
895 003114  012737  000340  000006       MOV     #340,6
896 003122  005737  177754             TST     CDR             ;READ DATA REGISTER
897 003126  000240                     NOP
898 003130  000240                     NOP
899 003132  000240                 25$: NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
    003134  000240                     NOP                     ;FOR  LOOP ON ERROR
900 003136  000411                     BR      10$             ;NO FAULT;GO TO NEXT TEST
901 003140  022626                 2$: CMP     (SP)+,(SP)+     ;READJUST STACK DUE TO INTERRUPT
902 003142  012737  000006  000004     MOV     #6,4            ;RESTORE TRAP VECTOR
903 003150  005037  000006             CLR     6
904 003154  104406                     ERROR                   ;ERROR
                                                            ;-----
    003156  003154                  .WORD   .-2
905                                                         ;CACHE REGISTER RESPONSE TESTS
906                                                         ;READING DATA REGISTER
907                                                         ;CAUSED TIMEOUT
908 003160  000000                  .WORD   0
909 003162  000240              10$: NOP                     ;END OF TEST
    003164  005237  001472            INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 6 - TEST ADRS SEL LOGIC - WRITE 1 TO BIT 0 OF CME
                                ;;*********************************************************************
                                ;*TEST 6 - TEST ADRS SEL LOGIC - WRITE 1 TO BIT 0 OF CME
                                ;*      TESTING ADDRESS SELECTION LOGIC BY WRITING ONE INTO UNUSED
                                ;*      CME REGISTER BIT00 THEN READ CONTENTS OF REGISTER BACK
                                ;*      LOOKING TO SEE IF BIT00 STILL READS AS 0.
                                ;*      IF BIT00 IS SET IT IS POSSIBLE WE ARE ADDRESSING THE WRONG
                                ;*      REGISTER
                                ;;*********************************************************************
    003170                      TST6:
918 003170  000004                  SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                            ;ERROR/LOOP ON TEST
    003172  003202                  .WORD   40$             ;TEST START LOCATION
    003174  003202                  .WORD   1$              ;LOOP ON ERROR START LOCATION
    003176  000000                  .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
    003200  003210                  .WORD   25$             ;LOOP ON ERROR END LOCATION
    003202                      40$:
919 003202  012737  000001  177744 1$:     MOV     #1,CME  ;WRITE 1 INTO BIT00
920 003210  000240              25$:    NOP                 ;INSTRUCTION 'JMP 1$' PLACED HERE
    003212  000240                  NOP                     ;FOR  LOOP ON ERROR
921 003214  032737  000001  177744      BIT     #1,CME      ;CHECK FOR 0
922 003222  001403                  BEQ     10$             ;PASS;NEXT TEST
923 003224  104406                  ERROR                   ;ERROR
                                                            ;-----
    003226  003224                  .WORD   .-2
924                                                         ;CACHE REGISTER RESPONSE TESTS
925                                                         ;UNUSED CME BIT00 READ AS 1
926                                                         ;POSSIBLE REG. ADDRESS ERROR
927 003230  000000                  .WORD   0
928 003232  000240              10$:    NOP                 ;END OF TEST
    003234  005237  001472          INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 7 - TEST BIT 0 OF DCPI & BIT 1 OF CCR
                                ;;*****************************************************************
                                ;*TEST 7 - TEST BIT 0 OF DCPI & BIT 1 OF CCR
                                ;*      ASSURING BIT00(DCPI) READS AS A 1 AND TESTING ADDRESS
                                ;*      SELECT LOGIC BY WRITING 1 INTO BIT00 OF CCR AND THEN
                                ;*      READING A 1.IF BIT00 READS AS 0 POSSIBLE ADDRESSING
                                ;*      WRONG REGISTER OR CCR REGISTER/DATA PATH  ARE BAD.
                                ;;*****************************************************************
    003240                      TST7:
936 003240  000004                  SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                            ;ERROR/LOOP ON TEST
    003242  003252                  .WORD   40$             ;TEST START LOCATION
    003244  003252                  .WORD   1$              ;LOOP ON ERROR START LOCATION
    003246  000000                  .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
    003250  003260                  .WORD   25$             ;LOOP ON ERROR END LOCATION
    003252                      40$:
937 003252  032737  000001  177746 1$:     BIT     #1,CCR          ;CHECK BIT00 FOR 1
938 003260  000240              25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
    003262  000240                  NOP                     ;FOR  LOOP ON ERROR
939 003264  001003                  BNE     10$             ;PASS;NXT TEST
940 003266  104406                  ERROR                   ;ERROR
                                                            ;-----
    003270  003266                  .WORD   .-2
941                                                         ;CACHE REGISTER RESPONSE TESTS
942                                                         ;WROTE 1 INTO BIT00 CCR; READ 0
943 003272  000000                  .WORD   0
944 003274  000240              10$:    NOP                     ;END OF TEST
    003276  005237  001472            INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
 949                                    .SBTTL  TEST # 10 - CACHE CONTROL REGISTER DATA TEST (CCR)
                                        ;;*********************************************************************
                                        ;*TEST 10 - CACHE CONTROL REGISTER DATA TEST (CCR)
                                        ;*      VERIFY THAT CCR BIT12(VCIP) READS AS A 0, SINCE A CLEARING
                                        ;*      OF VALID STORE SHOULD NOT BE HAPPENING AT THIS TIME
                                        ;;*********************************************************************
     003302                             TST10:
 950 003302  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     003304  003314                             .WORD   40$             ;TEST START LOCATION
     003306  003314                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     003310  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     003312  003322                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     003314                             40$:
 951 003314  032737  010000  177746     1$:     BIT     #BIT12,CCR      ;CHECK FOR 0
 952 003322  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     003324  000240                             NOP                     ;FOR  LOOP ON ERROR
 953 003326  001403                             BEQ     10$             ;PASS
 954 003330  104406                             ERROR                   ;ERROR
                                                                        ;-----
     003332  003330                             .WORD   .-2
 955                                                                    ;CCR.DATA TEST
 956                                                                    ;READ 1 FROM CCR BIT12. A CLEARING OF
 957                                                                    ;VALID STORE AT THIS TIME SHOULD NOT
 958                                                                    ;BE INDICATED
 959 003334  000000                             .WORD   0
 960 003336  000240                     10$:    NOP                     ;END OF TEST
     003340  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
966                                     .SBTTL  TEST # 11 - TEST BIT 0 OF CCR
                                        ;;*****************************************************************
                                        ;*TEST 11 - TEST BIT 0 OF CCR
                                        ;*      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
                                        ;;*****************************************************************
    003344
967 003344  000004                      TST11:  SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
    003346  003356                              .WORD   40$             ;TEST START LOCATION
    003350  003364                              .WORD   1$              ;LOOP ON ERROR START LOCATION
    003352  000000                              .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
    003354  003376                              .WORD   25$             ;LOOP ON ERROR END LOCATION
    003356                              40$:
968 003356  012737  001415  177746              MOV     #OFF+BIT08,CCR  ;DISABLE AND FLUSH CACHE
969 003364  042737  000001  177746      1$:     BIC     #BIT00,CCR      ;WRITE 0
970 003372  013700  177746                      MOV     CCR,R0          ;SAVE CCR CONTENTS
971 003376  000240                      25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
    003400  000240                              NOP                     ;FOR  LOOP ON ERROR
972 003402  032700  000001                      BIT     #BIT00,R0       ;CHECK FOR 0
973 003406  001403                              BEQ     10$             ;PASS; NXT TEST
974 003410  104406                              ERROR                   ;ERROR
                                                                        ;-----
    003412  003410                              .WORD   .-2
975                                                                     ;CCR DATA TEST
976                                                                     ;WROTE 0 INTO BIT00 CCR; READ 1
977 003414  000000                              .WORD   0
978 003416  000240                      10$:    NOP                     ;END OF TEST
    003420  005237  001472                      INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
 984                                    .SBTTL  TEST # 12 - TEST CLEARING OF BIT 2 OF CCR
                                        ;;*****************************************************************
                                        ;*TEST 12 - TEST CLEARING OF BIT 2 OF CCR
                                        ;*      WRITE ZERO INTO CCR BIT02(FMLO) THEN READ CCR
                                        ;*      IF BIT02 IS READ AS ONE THEN CCR REGISTER MAY BE BAD
                                        ;*      OR CACHE REGISTER DATA PATH MAY BE AT FAULT
                                        ;;*****************************************************************
     003424                             TST12:
 985 003424  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     003426  003436                             .WORD   40$             ;TEST START LOCATION
     003430  070000                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     003432  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     003434  070006                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     003436  012737  001015  177746    40$:     MOV     #OFF,CCR        ;DISABLE CACHE
     003444  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     003450  003514                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

 986 003452  042737  000004  177746    1$:      BIC     #BIT02,CCR      ;WRITE 0
 987 003460  000240                     25$:     NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     003462  000240                              NOP                     ;FOR  LOOP ON ERROR
 988 003464  013701  177746                     MOV     CCR,R1          ;SAVE CCR CONTENTS
 989 003470  012737  001015  177746             MOV     #OFF,CCR        ;DISABLE CACHE
 990 003476  032701  000004                     BIT     #BIT02,R1       ;CHECK FOR 0
 991 003502  001403                             BEQ     10$             ;PASS; NXT TEST
 992 003504  104406                             ERROR                   ;ERROR
                                                                        ;-----
     003506  003504                             .WORD   .-2
 993                                                                    ;CCR DATA TEST
 994                                                                    ;WROTE 0 INTO CCR BIT02; READ 1
 995 003510  000000                             .WORD   0
 996 003512  000240                     10$:     NOP                     ;END OF TEST
     003514  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
1002                                    .SBTTL  TEST # 13 - TEST SETTING OF BIT 2 OF CCR
                                        ;;*****************************************************************
                                        ;*TEST 13 - TEST SETTING OF BIT 2 OF CCR
                                        ;*      WRITE ONE INTO CCR BIT02(FMLO) AND ASSURE THAT IT READS  1.
                                        ;*      IF READS BACK AS 0 THEN CCR MAY BE BAD OR CACE DATA PATH
                                        ;*      IS AT FAULT
                                        ;;*****************************************************************
     003520                             TST13:
1003 003520  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     003522  003532                             .WORD   40$             ;TEST START LOCATION
     003524  003532                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     003526  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     003530  003540                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     003532                             40$:
1004 003532  052737  000004  177746    1$:     BIS     #FMLO,CCR       ;
1005 003540  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     003542  000240                             NOP                     ;FOR  LOOP ON ERROR
1006 003544  032737  000004  177746             BIT     #BIT02,CCR      ;CHECK FOR 1
1007 003552  001003                             BNE     10$             ;PASS
1008 003554  104406                             ERROR                   ;ERROR
                                                                        ;-----
     003556  003554                             .WORD   .-2
1009                                                                    ;CCR DATA TEST
1010                                                                    ;WROTE 1 INTO CCR BIT02; READ 0
1011 003560  000000                             .WORD   0
1012 003562  000240                     10$:    NOP                     ;END OF TEST
     003564  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                                                                I 3
1018                                    .SBTTL  TEST # 14 - TEST CLEARING OF CCR BIT 3
                                        ;;*********************************************************************
                                        ;*TEST 14 - TEST CLEARING OF CCR BIT 3
                                        ;*      WRITE ZERO INTO CCR BIT03(FMHI) 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
                                        ;;*********************************************************************
     003570                             TST14:
1019 003570  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     003572  003602                             .WORD   40$             ;TEST START LOCATION
     003574  060000                             .WORD   1$-40$+57764    ;LOOP ON ERROR START LOCATION
     003576  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     003600  060012                             .WORD   25$-40$+57764   ;LOOP ON ERROR END LOCATION
     003602  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     003610  004437  002342                     JSR     R4,RELCTL       ;LOCATE TEST CODE TO LOW CACHE SPACE
     003614  003660                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO LOW CACHE SPACE

1020 003616  042737  000010  177746  1$:       BIC     #BIT03,CCR      ;WRITE 0
1021 003624  013700  177746                     MOV     CCR,R0          ;SAVE CONTENTS OF CCR
1022 003630  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     003632  000240                             NOP                     ;FOR  LOOP ON ERROR
1023 003634  012737  001015  177746             MOV     #OFF,CCR        ;;DISABLE CACHE
1024 003642  032700  000010                     BIT     #BIT03,R0       ;CHECK FOR 0
1025 003646  001403                             BEQ     10$             ;PASS
1026 003650  104406                             ERROR                   ;ERROR
                                                                        ;-----
     003652  003650                             .WORD   .-2
1027                                                                    ;CCR DATA TEST
1028                                                                    ;WROTE 0 INTO CCR BIT03; READ 1
1029 003654  000000                             .WORD   0
1030 003656  000240                     10$:    NOP                     ;END OF TEST
     003660  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
1036                                    .SBTTL  TEST # 15 - TEST SETTING OF CCR BIT 3
                                        ;;*****************************************************************
                                        ;*TEST 15 - TEST SETTING OF CCR BIT 3
                                        ;*      WRITE 1 INTO CCR BIT03(MHI) AND ASSURE IT READS 1.
                                        ;*      IF CCR BIT03 READ AS ZERO THEN CCR REGISTER BIT MAY BE BAD
                                        ;*      OR CACHE REGISTER DATA PATH MAY BE AT FAULT
                                        ;;*****************************************************************
     003664                             TST15:
1037 003664  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     003666  003676                             .WORD   40$             ;TEST START LOCATION
     003670  003676                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     003672  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     003674  003704                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     003676                             40$:
1038 003676  052737  000010  177746    1$:     BIS     #FMHI,CCR       ;
1039 003704  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     003706  000240                             NOP                     ;FOR  LOOP ON ERROR
1040 003710  032737  000010  177746             BIT     #BIT03,CCR      ;CHECK FOR 1
1041 003716  001003                             BNE     10$             ;PASS
1042 003720  104406                             ERROR                   ;ERROR
                                                                        ;-----
     003722  003720                             .WORD   .-2
1043                                                                    ;CCR DATA TEST
1044                                                                    ;WROTE 1 INTO CCR BIT03; READ 0
1045 003724  000000                             .WORD   0
1046 003726  000240                     10$:    NOP                     ;END OF TEST
     003730  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                        .SBTTL  TEST # 16 - TEST CLEARING OF BIT 6 OF CCR
                                        ;;*****************************************************************
                                        ;*TEST 16 - TEST CLEARING OF BIT 6 OF CCR
                                        ;*      WRITE 0 INTO CCR BIT06(WWPD) THEN READ CCR
                                        ;*      IF BIT06 READ AS ONE THEN CCR REGISTER BIT MAY BE BAD
                                        ;*      OR CACHE REGISTER DATA PATH MAY BE AT FAULT
                                        ;;*****************************************************************
     003734                             TST16:
1053 003734  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     003736  003746                             .WORD   40$             ;TEST START LOCATION
     003740  003746                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     003742  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     003744  003754                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     003746                             40$:
1054 003746  042737  000100  177746    1$:     BIC     #BIT06,CCR      ;WRITE 0
1055 003754  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     003756  000240                             NOP                     ;FOR  LOOP ON ERROR
1056 003760  032737  000100  177746            BIT     #BIT06,CCR      ;CHECK FOR 0
1057 003766  001403                             BEQ     10$             ;PASS
1058 003770  104406                             ERROR                   ;ERROR
                                                                        ;-----
     003772  003770                             .WORD   .-2
1059                                                                    ;CCR DATA TEST
1060                                                                    ;WROTE 0 INTO CCR BIT06; READ 1
1061 003774  000000                             .WORD   0
1062 003776  000240                     10$:    NOP                     ;END OF TEST
     004000  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                        .SBTTL  TEST # 17 - TEST CLEARING OF BIT 7 OF CCR
                                        ;;*********************************************************************
                                        ;*TEST 17 - TEST CLEARING OF BIT 7 OF CCR
                                        ;*      WRITE ZERO INTO CCR BIT07(PEA) 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
                                        ;;*********************************************************************
     004004                             TST17:
1069 004004  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     004006  004016                             .WORD   40$             ;TEST START LOCATION
     004010  004016                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     004012  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     004014  004024                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     004016                             40$:
1070 004016  042737  000200  177746    1$:     BIC     #BIT07,CCR      ;WRITE 0
1071 004024  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     004026  000240                             NOP                     ;FOR  LOOP ON ERROR
1072 004030  032737  000200  177746            BIT     #BIT07,CCR      ;CHECK FOR 0
1073 004036  001403                             BEQ     10$             ;PASS
1074 004040  104406                             ERROR                   ;ERROR
                                                                        ;-----
     004042  004040                             .WORD   .-2
1075                                                                    ;CCR DATA TEST
1076                                                                    ;WROTE 0 INTO CCR BIT07; READ 1
1077 004044  000000                             .WORD   0
1078 004046  000240                     10$:    NOP                     ;END OF TEST
     004050  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
1084                                    .SBTTL  TEST # 20 - TEST SETTING OF BIT 7 OF CCR
                                        ;;*****************************************************************
                                        ;*TEST 20 - TEST SETTING OF BIT 7 OF CCR
                                        ;*      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
                                        ;;*****************************************************************
     004054                             TST20:
1085 004054  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     004056  004066                             .WORD   40$             ;TEST START LOCATION
     004060  004066                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     004062  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     004064  004100                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     004066                             40$:
1086 004066  052737  000200  177746    1$:     BIS     #BIT07,CCR      ;WRITE 1
1087 004074  013700  177746                    MOV     CCR,R0          ;SAVE CCR CONTENTS
1088 004100  000240                    25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     004102  000240                            NOP                     ;FOR  LOOP ON ERROR
1089 004104  012737  001015  177746            MOV     #OFF,CCR        ;DISABLE CACHE
1090 004112  032700  000200                    BIT     #BIT07,R0       ;CHECK FOR 1
1091 004116  001003                            BNE     10$             ;PASS
1092 004120  104406                            ERROR                   ;ERROR
                                                                        ;-----
     004122  004120                            .WORD   .-2
1093                                                                    ;CCR DATA TEST
1094                                                                    ;WROTE 1 INTO CCR BIT07; READ 0
1095 004124  000000                            .WORD   0
1096 004126  000240                    10$:    NOP                     ;END OF TEST
     004130  005237  001472                    INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
1102                                    .SBTTL  TEST # 21 - TEST CLEARING OF BIT 8 OF CCR
                                        ;;*****************************************************************
                                        ;*TEST 21 - TEST CLEARING OF BIT 8 OF CCR
                                        ;*      WRITE ZERO INTO CCR BIT08(FC) 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
                                        ;;*****************************************************************
     004134                             TST21:
1103 004134  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     004136  004146                             .WORD   40$             ;TEST START LOCATION
     004140  004146                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     004142  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     004144  004154                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     004146                             40$:
1104 004146  042737  000400  177746    1$:     BIC     #BIT08,CCR      ;WRITE 0
1105 004154  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     004156  000240                             NOP                     ;FOR  LOOP ON ERROR
1106 004160  032737  000400  177746            BIT     #BIT08,CCR      ;CHECK FOR 0
1107 004166  001401                             BEQ     10$             ;PASS
1108                                                                    ;CCR DATA TEST
1109                                                                    ;WROTE 0 INTO CCR BIT08; READ 1
1110 004170  000000                             .WORD   0
1111 004172  000240                     10$:    NOP                     ;END OF TEST
     004174  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 22 - TEST SETTING OF BIT 9 OF CCR
                                ;;*****************************************************************
                                ;*TEST 22 - TEST SETTING OF BIT 9 OF CCR
                                ;*      WRITE 1 INTO CCR BIT09(UCB) AND ASSURE IT READS 1.
                                ;*      IF CCR BIT09 READ AS ZERO THEN CCR REGISTER BIT MAY BE BAD
                                ;*      OR CACHE REGISTER DATA PATH MAY BE AT FAULT
                                ;;*****************************************************************
    004200                      TST22:
1118 004200  000004                     SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                ;ERROR/LOOP ON TEST
     004202  004212                     .WORD   40$             ;TEST START LOCATION
     004204  004212                     .WORD   1$              ;LOOP ON ERROR START LOCATION
     004206  000000                     .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     004210  004220                     .WORD   25$             ;LOOP ON ERROR END LOCATION
     004212                     40$:
1119 004212  052737  001000  177746 1$:     BIS     #UCB,CCR        ;
1120 004220  000240                25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     004222  000240                        NOP                     ;FOR  LOOP ON ERROR
1121 004224  032737  001000  177746        BIT     #BIT09,CCR      ;CHECK FOR 1
1122 004232  C01003                        BNE     10$             ;PASS
1123 004234  104406                        ERROR                   ;ERROR
                                                                ;-----
     004236  004234                        .WORD   .-2
1124                                                            ;CCR DATA TEST
1125                                                            ;WROTE 1 INTO CCR BIT09; READ 0
1126 004240  000000                        .WORD   0
1127 004242  000240                10$:    NOP                     ;END OF TEST
     004244  005237  001472                INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
1131                                    .SBTTL  TEST # 23 - TEST CLEARING BIT 10 OF CCR
                                        ;;*********************************************************************
                                        ;*TEST 23 - TEST CLEARING BIT 10 OF CCR
                                        ;*      WRITE ZERO INTO CCR BIT10(WWPT) AND READ 0
                                        ;;*********************************************************************
     004250                             TST23:
1132 004250  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     004252  004262                             .WORD   40$             ;TEST START LOCATION
     004254  004262                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     004256  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     004260  004270                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     004262                             40$:
1133 004262  042737  002000  177746    1$:     BIC     #BIT10,CCR      ;WRITE 0
1134 004270  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     004272  000240                             NOP                     ;FOR  LOOP ON ERROR
1135 004274  032737  002000  177746            BIT     #BIT10,CCR      ;CHECK FOR 0
1136 004302  001403                             BEQ     10$             ;PASS
1137 004304  104406                             ERROR                   ;ERROR
                                                                        ;-----
     004306  004304                             .WORD   .-2
1138                                                                    ;CCR DATA TEST
1139                                                                    ;WROTE 0 INTO CCR BIT 10; READ 1
1140 004310  000000                             .WORD   0
1141 004312  000240                     10$:    NOP                     ;END OF TEST
     004314  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
1146                                    .SBTTL  TEST # 24 - CACHE CONTROL REGISTER UNUSED BIT TEST(CCR)
                                        ;;*****************************************************************
                                        ;*TEST 24 - CACHE CONTROL REGISTER UNUSED BIT TEST(CCR)
                                        ;*      WRITE INTO UNUSED CCR REGISTER BIT01 THEN READ CCR
                                        ;*      IF CCR BIT01 READ AS ONE THEN CACHE DATA PATH
                                        ;;*****************************************************************
     004320                             TST24:
1147 004320  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     004322  004332                             .WORD   40$             ;TEST START LOCATION
     004324  004332                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     004326  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     004330  004340                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     004332                             40$:
1148 004332  052737  000002  177746    1$:     BIS     #BIT01,CCR      ;WRITE 1 INTO UNUSED BIT
1149 004340  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     004342  000240                             NOP                     ;FOR  LOOP ON ERROR
1150 004344  032737  000002  177746            BIT     #BIT01,CCR      ;CHECK THAT BIT READS 0
1151 004352  001403                             BEQ     10$             ;PASS
1152 004354  104406                             ERROR                   ;ERROR
                                                                        ;-----
     004356  004354                             .WORD   .-2
1153                                                                    ;CCR UNUSED BIT TEST
1154                                                                    ;READ 1 FROM UNUSED CCR BIT01
1155                                                                    ;SHOULD READ 0
1156 004360  000000                             .WORD   0
1157 004362  000240                     10$:    NOP                     ;END OF TEST
     004364  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
1162                                    .SBTTL  TEST # 25 - TEST UNUSED BIT 4 OF CCR
                                        ;;*****************************************************************
                                        ;*TEST 25 - TEST UNUSED BIT 4 OF CCR
                                        ;*      WRITE ONE INTO UNUSED CCR BIT04 THEN READ CCR
                                        ;*      IF CCR BIT04 READ AS ONE THEN CACHE REGISTER DATA PATH ERROR
                                        ;;*****************************************************************
     004370                             TST25:
1163 004370  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     004372  004402                             .WORD   40$             ;TEST START LOCATION
     004374  004402                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     004376  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     004400  004410                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     004402                             40$:
1164 004402  052737  000020  177746    1$:     BIS     #BIT04,CCR      ;WRITE 1 INTO UNUSED BIT
1165 004410  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     004412  000240                             NOP                     ;FOR  LOOP ON ERROR
1166 004414  032737  000020  177746            BIT     #BIT04,CCR      ;CHECK THAT BIT READS 0
1167 004422  001403                             BEQ     10$             ;PASS
1168 004424  104406                             ERROR                   ;ERROR
                                                                        ;-----
     004426  004424                             .WORD   .-2
1169                                                                    ;CCR UNUSED BIT TEST
1170                                                                    ;READ 1 FROM UNUSED CCR BIT04
1171                                                                    ;SHOULD READ 0
1172 004430  000000                             .WORD   0
1173 004432  000240                     10$:    NOP                     ;END OF TEST
     004434  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
1178                                    .SBTTL  TEST # 26 - TEST UNUSED BIT 5 OF CCR
                                        ;;*********************************************************************
                                        ;*TEST 26 - TEST UNUSED BIT 5 OF CCR
                                        ;*      WRITE ONE INTO UNUSED CCR BIT05 THEN READ CCR
                                        ;*      IF CCR BIT05 READ AS ONE THEN CACHE REGISTER DATA PATH ERROR
                                        ;;*********************************************************************
     004440                             TST26:
1179 004440  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     004442  004452                             .WORD   40$             ;TEST START LOCATION
     004444  004452                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     004446  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     004450  004460                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     004452                             40$:
1180 004452  052737  000040  177746    1$:     BIS     #BIT05,CCR      ;WRITE 1 INTO UNUSED BIT
1181 004460  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     004462  000240                             NOP                     ;FOR  LOOP ON ERROR
1182 004464  032737  000040  177746            BIT     #BIT05,CCR      ;CHECK THAT BIT READS 0
1183 004472  001403                             BEQ     10$             ;PASS
1184 004474  104406                             ERROR                   ;ERROR
                                                                        ;-----
     004476  004474                             .WORD   .-2
1185                                                                    ;CCR UNUSED BIT TEST
1186                                                                    ;READ 1 FROM UNUSED CCR BIT05
1187                                                                    ;SHOULD READ 0
1188 004500  000000                             .WORD   0
1189 004502  000240                     10$:    NOP                     ;END OF TEST
     004504  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
1194                                    .SBTTL  TEST # 27 - TEST UNUSED BIT 8 OF CCR
                                        ;;*****************************************************************
                                        ;*TEST 27 - TEST UNUSED BIT 8 OF CCR
                                        ;*      WRITE ONE INTO UNUSED CCR BIT08 THEN READ CCR
                                        ;*      IF CCR BIT08 READ AS ONE THEN CACHE REGISTER DATA PATH ERROR
                                        ;;*****************************************************************
     004510                             TST27:
1195 004510  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     004512  004522                             .WORD   40$             ;TEST START LOCATION
     004514  004522                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     004516  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     004520  004530                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     004522                             40$:
1196 004522  052737  000400  177746    1$:     BIS     #BIT08,CCR      ;WRITE 1 INTO UNUSED BIT
1197 004530  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     004532  000240                             NOP                     ;FOR  LOOP ON ERROR
1198 004534  032737  000400  177746            BIT     #BIT08,CCR      ;CHECK THAT BIT READS 0
1199 004542  001403                             BEQ     10$             ;PASS
1200 004544  104406                             ERROR                   ;ERROR
                                                                        ;-----
     004546  004544                             .WORD   .-2
1201
1202                                                                    ;CCR UNUSED BIT TEST
1203                                                                    ;READ 1 FROM UNUSED CCR BIT08
                                                                        ;SHOULD READ 0
1204 004550  000000                             .WORD   0
1205 004552  000240                     10$:    NOP                     ;END OF TEST
     004554  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
1210                                    .SBTTL  TEST # 30 - TEST UNUSED BIT 11 OF CCR
                                        ;;*********************************************************************
                                        ;*TEST 30 - TEST UNUSED BIT 11 OF CCR
                                        ;*      WRITE ONE INTO UNUSED CCR BIT11 THEN READ CCR
                                        ;*      IF CCR BIT11 READ AS ONE THEN CACHE REGISTER DATA PATH ERROR
                                        ;;*********************************************************************
     004560                             TST30:
1211 004560  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     004562  004572                             .WORD   40$             ;TEST START LOCATION
     004564  004572                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     004566  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     004570  004600                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     004572                             40$:
1212 004572  052737  004000  177746    1$:     BIS     #BIT11,CCR      ;WRITE 1 INTO UNUSED BIT
1213 004600  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     004602  000240                             NOP                     ;FOR  LOOP ON ERROR
1214 004604  032737  004000  177746            BIT     #BIT11,CCR      ;CHECK THAT BIT READS 0
1215 004612  001403                             BEQ     10$             ;PASS
1216 004614  104406                             ERROR                   ;ERROR
                                                                        ;-----
     004616  004614                             .WORD   .-2
1217                                                                    ;CCR UNUSED BIT TEST
1218                                                                    ;READ 1 FROM UNUSED CCR BIT11
1219                                                                    ;SHOULD READ 0
1220 004620  000000                             .WORD   0
1221 004622  000240                     10$:    NOP                     ;END OF TEST
     004624  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

TEST # 31 - TEST UNUSED BIT 14 OF CCR

```
1226                                    .SBTTL  TEST # 31 - TEST UNUSED BIT 14 OF CCR
                                        ;;**********************************************************************
                                        ;*TEST 31 - TEST UNUSED BIT 14 OF CCR
                                        ;*      WRITE ONE INTO UNUSED CCR BIT14 THEN READ CCR
                                        ;*      IF CCR BIT14 READ AS ONE THEN CACHE REGISTER DATA PATH ERROR
                                        ;;**********************************************************************
     004630                             TST31:
1227 004630  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     004632  004642                             .WORD   40$             ;TEST START LOCATION
     004634  004642                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     004636  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     004640  004650                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     004642                             40$:
1228 004642  052737  040000  177746    1$:     BIS     #BIT14,CCR      ;WRITE 1 INTO UNUSED BIT
1229 004650  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     004652  000240                             NOP                     ;FOR  LOOP ON ERROR
1230 004654  032737  040000  177746            BIT     #BIT14,CCR      ;CHECK THAT BIT READS 0
1231 004662  001403                             BEQ     10$             ;PASS
1232 004664  104406                             ERROR                   ;ERROR
                                                                        ;-----
     004666  004664                             .WORD   .-2
1233                                                                    ;CCR UNUSED BIT TEST
1234                                                                    ;READ 1 FROM UNUSED CCR BIT14
1235                                                                    ;SHOULD READ 0
1236 004670  000000                             .WORD   0
1237 004672  000240                     10$:    NOP                     ;END OF TEST
     004674  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
1242                                    .SBTTL  TEST # 32 - TEST UNUSED BIT 15 OF CCR
                                        ;;*********************************************************************
                                        ;*TEST 32 - TEST UNUSED BIT 15 OF CCR
                                        ;*      WRITE 1 INTO UNUSED CCR BIT15 THEN READ CCR
                                        ;*      IF CCR BIT15 READ AS ONE THEN CACHE REGISTER DATA PATH ERROR
                                        ;;*********************************************************************
     004700                             TST32:
1243 004700  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     004702  004712                             .WORD   40$             ;TEST START LOCATION
     004704  004712                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     004706  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     004710  004720                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     004712                             40$:
1244 004712  052737  100000  177746    1$:     BIS     #BIT15,CCR      ;WRITE 1 INTO UNUSED BIT
1245 004720  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     004722  000240                             NOP                     ;FOR  LOOP ON ERROR
1246 004724  032737  100000  177746            BIT     #BIT15,CCR      ;CHECK THAT BIT READS 0
1247 004732  001403                             BEQ     10$             ;PASS
1248 004734  104406                             ERROR                   ;ERROR
                                                                        ;-----
     004736' 004734                             .WORD   .-2
1249                                                                    ;CCR UNUSED BIT TEST
1250                                                                    ;READ 1 FROM UNUSED CCR BIT15
1251                                                                    ;SHOULD READ 0
1252 004740  000000                             .WORD   0
1253 004742  000240                     10$:    NOP                     ;END OF TEST
     004744  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
1258                                    .SBTTL  TEST # 33 - CME UNUSED BIT 0 TEST
                                        ;;*********************************************************************
                                        ;*TEST 33 - CME UNUSED BIT 0 TEST
                                        ;*      ATTEMPT WRITE 1 INTO ALL UNUSED BITS OF CME.
                                        ;*      ALL BITS SHOULD READ 0.
                                        ;;*********************************************************************
     004750                             TST33:
1259 004750  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     004752  004762                             .WORD   40$             ;TEST START LOCATION
     004754  004762                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     004756  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     004760  004770                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     004762                             40$:
1260 004762  052737  000001  177744    1$:     BIS     #BIT00,CME      ;WRITE 1 INTO BIT00
1261 004770  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     004772  000240                             NOP                     ;FOR  LOOP ON ERROR
1262 004774  032737  000001  177744            BIT     #BIT00,CME      ;CHECK FOR 0
1263 005002  001403                             BEQ     10$             ;PASS
1264 005004  104406                             ERROR                   ;ERROR
                                                                        ;-----
     005006  005004                             .WORD   .-2
1265                                                                    ;CME UNUSED BIT TEST
1266                                                                    ;READ 1 FROM UNUSED CME BIT00
1267 005010  000000                             .WORD   0
1268 005012  000240                     10$:    NOP                     ;END OF TEST
     005014  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                        .SBTTL  TEST # 34 - CME UNUSED BIT 1 TEST
                                        ;;*********************************************************************
                                        ;*TEST 34 - CME UNUSED BIT 1 TEST
                                        ;;*********************************************************************
     005020                             TST34:
1270 005020  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     005022  005032                             .WORD   40$             ;TEST START LOCATION
     005024  005032                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     005026  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     005030  005040                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     005032                             40$:
1271 005032  052737  000002  177744    1$:     BIS     #BIT01,CME      ;WRITE 1 INTO BIT01
1272 005040  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     005042  000240                             NOP                     ;FOR  LOOP ON ERROR
1273 005044  032737  000002  177744            BIT     #BIT01,CME      ;CHECK FOR 0
1274 005052  001403                             BEQ     10$             ;PASS
1275 005054  104406                             ERROR                   ;ERROR
                                                                        ;-----
     005056  005054                             .WORD   .-2
1276                                                                    ;CME UNUSED BIT TEST
1277                                                                    ;READ 1 FROM UNUSED CME BIT01
1278 005060  000000                             .WORD   0
1279 005062  000240                     10$:    NOP                     ;END OF TEST
     005064  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

TEST # 35 - CME UNUSED BIT 2 TEST

```
1280                                    .SBTTL  TEST # 35 - CME UNUSED BIT 2 TEST
                                        ;;*********************************************************************
                                        ;*TEST 35 - CME UNUSED BIT 2 TEST
                                        ;;*********************************************************************
     005070                             TST35:
1281 005070  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     005072  005102                             .WORD   40$             ;TEST START LOCATION
     005074  005102                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     005076  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     005100  005110                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     005102                             40$:
1282 005102  052737  000004  177744    1$:     BIS     #BIT02,CME      ;WRITE 1 INTO BIT02
1283 005110  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     005112  000240                             NOP                     ;FOR  LOOP ON ERROR
1284 005114  032737  000004  177744            BIT     #BIT02,CME      ;CHECK FOR 0
1285 005122  001403                             BEQ     10$             ;PASS
1286 005124  104406                             ERROR                   ;ERROR
                                                                        ;-----
     005126  005124                             .WORD   .-2
1287                                                                    ;CME UNUSED BIT TEST
1288                                                                    ;READ 1 FROM UNUSED CME BIT02
1289 005130  000000                             .WORD   0
1290 005132  000240                     10$:    NOP                     ;END OF TEST
     005134  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                        .SBTTL  TEST # 36 - CME UNUSED BIT 3 TEST
                                        ;;*********************************************************************
                                        ;*TEST 36 - CME UNUSED BIT 3 TEST
                                        ;;*********************************************************************
      005140                            TST36:
1292  005140  000004                            SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
      005142  005152                            .WORD   40$             ;TEST START LOCATION
      005144  005152                            .WORD   1$              ;LOOP ON ERROR START LOCATION
      005146  000000                            .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
      005150  005160                            .WORD   25$             ;LOOP ON ERROR END LOCATION
      005152                            40$:
1293  005152  052737  000010  177744    1$:     BIS     #BIT03,CME      ;WRITE 1 INTO BIT03
1294  005160  000240                    25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
      005162  000240                            NOP                     ;FOR  LOOP ON ERROR
1295  005164  032737  000010  177744            BIT     #BIT03,CME      ;CHECK FOR 0
1296  005172  001403                            BEQ     10$             ;PASS
1297  005174  104406                            ERROR                   ;ERROR
                                                                        ;-----
      005176  005174                            .WORD   .-2
1298                                                                    ;CME UNUSED BIT TEST
1299                                                                    ;READ 1 FROM UNUSED CME BIT03
1300  005200  000000                            .WORD   0
1301  005202  000240                    10$:    NOP                     ;END OF TEST
      005204  005237  001472                    INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
1302                                    .SBTTL  TEST # 37 - CME UNUSED BIT 4 TEST
                                        ;;*********************************************************************
                                        ;*TEST 37 - CME UNUSED BIT 4 TEST
                                        ;;*********************************************************************
     005210                             TST37:
1303 005210  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     005212  005222                             .WORD   40$             ;TEST START LOCATION
     005214  005222                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     005216  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     005220  005230                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     005222                             40$:
1304 005222  052737  000020  177744    1$:     BIS     #BIT04,CME      ;WRITE 1 INTO BIT04
1305 005230  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     005232  000240                             NOP                     ;FOR  LOOP ON ERROR
1306 005234  032737  000020  177744            BIT     #BIT04,CME      ;CHECK FOR 0
1307 005242  001403                             BEQ     10$             ;PASS
1308 005244  104406                             ERROR                   ;ERROR
                                                                        ;-----
     005246  005244                             .WORD   .-2
1309                                                                    ;CME UNUSED BIT TEST
1310                                                                    ;READ 1 FROM UNUSED CME BIT04
1311 005250  000000                             .WORD   0
1312 005252  000240                     10$:    NOP                     ;END OF TEST
     005254  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                        .SBTTL  TEST # 40 - CME UNUSED BIT 8 TEST
                                        ;;*********************************************************************
                                        ;*TEST 40 - CME UNUSED BIT 8 TEST
                                        ;;*********************************************************************
     005260                             TST40:
1314 005260  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     005262  005272                             .WORD   40$             ;TEST START LOCATION
     005264  005272                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     005266  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     005270  005300                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     005272                             40$:
1315 005272  052737  000400  177744    1$:     BIS     #BIT08,CME      ;WRITE 1 INTO BIT08
1316 005300  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     005302  000240                             NOP                     ;FOR LOOP ON ERROR
1317 005304  032737  000400  177744            BIT     #BIT08,CME      ;CHECK FOR 0
1318 005312  001403                             BEQ     10$             ;PASS
1319 005314  104406                             ERROR                   ;ERROR
                                                                        ;-----
     005316  005314                             .WORD   .-2
1320                                                                    ;CME UNUSED BIT TEST
1321                                                                    ;READ 1 FROM UNUSED CME BIT08
1322 005320  000000                             .WORD   0
1323 005322  000240                     10$:    NOP                     ;END OF TEST
     005324  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
 1324                                   .SBTTL  TEST # 41 - CME UNUSED BIT 9 TEST
                                        ;;*****************************************************************
                                        ;*TEST 41 - CME UNUSED BIT 9 TEST
                                        ;;*****************************************************************
      005330                            TST41:
 1325 005330  000004                            SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
      005332  005342                            .WORD   40$             ;TEST START LOCATION
      005334  005342                            .WORD   1$              ;LOOP ON ERROR START LOCATION
      005336  000000                            .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
      005340  005350                            .WORD   25$             ;LOOP ON ERROR END LOCATION
      005342                            40$:
 1326 005342  052737  001000  177744   1$:     BIS     #BIT09,CME      ;WRITE 1 INTO BIT09
 1327 005350  000240                    25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
      005352  000240                            NOP                     ;FOR  LOOP ON ERROR
 1328 005354  032737  001000  177744           BIT     #BIT09,CME      ;CHECK FOR 0
 1329 005362  001403                            BEQ     10$             ;PASS
 1330 005364  104406                            ERROR                   ;ERROR
                                                                        ;-----
      005366  005364                            .WORD   .-2
 1331                                                                   ;CME UNUSED BIT TEST
 1332                                                                   ;READ 1 FROM UNUSED CME BIT09
 1333 005370  000000                            .WORD   0
 1334 005372  000240                    10$:    NOP                     ;END OF TEST
      005374  005237  001472                    INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
1335                                    .SBTTL  TEST # 42 - CME UNUSED BIT 10 TEST
                                        ;;*****************************************************************
                                        ;*TEST 42 - CME UNUSED BIT 10 TEST
                                        ;;*****************************************************************
     005400                             TST42:
1336 005400  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     005402  005412                             .WORD   40$             ;TEST START LOCATION
     005404  005412                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     005406  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     005410  005420                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     005412                             40$:
1337 005412  052737  002000  177744    1$:     BIS     #BIT10,CME      ;WRITE 1 INTO BIT10
1338 005420  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     005422  000240                             NOP                     ;FOR  LOOP ON ERROR
1339 005424  032737  002000  177744            BIT     #BIT10,CME      ;CHECK FOR 0
1340 005432  001403                             BEQ     10$             ;PASS
1341 005434  104406                             ERROR                   ;ERROR
                                                                        ;-----
     005436  005434                             .WORD   .-2
1342
1343                                                                    ;CME UNUSED BIT TEST
                                                                        ;READ 1 FROM UNUSED CME BIT10
1344 005440  000000                             .WORD   0
1345 005442  000240                     10$:    NOP                     ;END OF TEST
     005444  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

TEST # 43 - CME UNUSED BIT 11 TEST

```
1346                                    .SBTTL  TEST # 43 - CME UNUSED BIT 11 TEST
                                        ;;*********************************************************************
                                        ;*TEST 43 - CME UNUSED BIT 11 TEST
                                        ;;*********************************************************************
     005450                             TST43:
1347 005450  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     005452  005462                             .WORD   40$             ;TEST START LOCATION
     005454  005462                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     005456  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     005460  005470                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     005462                             40$:
1348 005462  052737  004000  177744    1$:     BIS     #BIT11,CME      ;WRITE 1 INTO BIT11
1349 005470  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     005472  000240                             NOP                     ;FOR  LOOP ON ERROR
1350 005474  032737  004000  177744            BIT     #BIT11,CME      ;CHECK FOR 0
1351 005502  001403                             BEQ     10$             ;PASS
1352 005504  104406                             ERROR                   ;ERROR
                                                                        ;-----
     005506  005504                             .WORD   .-2
1353                                                                    ;CME UNUSED BIT TEST
1354                                                                    ;READ 1 FROM UNUSED CME BIT11
1355 005510  000000                             .WORD   0
1356 005512  000240                     10$:    NOP                     ;END OF TEST
     005514  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                        .SBTTL  TEST # 44 - CME UNUSED BIT 12 TEST
                                        ;;*********************************************************************
                                        ;*TEST 44 - CME UNUSED BIT 12 TEST
                                        ;;*********************************************************************
     005520                             TST44:
1358 005520  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     005522  005532                             .WORD   40$             ;TEST START LOCATION
     005524  005532                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     005526  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     005530  005540                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     005532                             40$:
1359 005532  052737  010000  177744    1$:     BIS     #BIT12,CME      ;WRITE 1 INTO BIT12
1360 005540  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     005542  000240                             NOP                     ;FOR  LOOP ON ERROR
1361 005544  032737  010000  177744            BIT     #BIT12,CME      ;CHECK FOR 0
1362 005552  001403                             BEQ     10$             ;PASS
1363 005554  104406                             ERROR                   ;ERROR
                                                                        ;-----
     005556  005554                             .WORD   .-2
1364                                                                    ;CME UNUSED BIT TEST
1365                                                                    ;READ 1 FROM UNUSED CME BIT12
1366 005560  000000                             .WORD   0
1367 005562  000240                     10$:    NOP                     ;END OF TEST
     005564  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

TEST # 45 - CME UNUSED BIT 13 TEST

```
1368                                    .SBTTL  TEST # 45 - CME UNUSED BIT 13 TEST
                                        ;;*****************************************************************
                                        ;*TEST 45 - CME UNUSED BIT 13 TEST
                                        ;;*****************************************************************
     005570                             TST45:
1369 005570  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     005572  005602                             .WORD   40$             ;TEST START LOCATION
     005574  005602                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     005576  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     005600  005610                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     005602                             40$:
1370 005602  052737  020000  177744    1$:     BIS     #BIT13,CME      ;WRITE 1 INTO BIT13
1371 005610  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     005612  000240                             NOP                     ;FOR  LOOP ON ERROR
1372 005614  032737  020000  177744            BIT     #BIT13,CME      ;CHECK FOR 0
1373 005622  001403                             BEQ     10$             ;PASS
1374 005624  104406                             ERROR                   ;ERROR
                                                                        ;-----
     005626  005624                             .WORD   .-2
1375                                                                    ;CME UNUSED BIT TEST
1376                                                                    ;READ 1 FROM UNUSED CME BIT13
1377 005630  000000                             .WORD   0
1378 005632  000240                     10$:    NOP                     ;END OF TEST
     005634  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                        .SBTTL  TEST # 46 - CME UNUSED BIT 14 TEST
                                        ;;*********************************************************************
                                        ;*TEST 46 - CME UNUSED BIT 14 TEST
                                        ;;*********************************************************************
     005640                             TST46:
1380 005640  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     005642  005652                             .WORD   40$             ;TEST START LOCATION
     005644  005652                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     005646  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     005650  005660                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     005652                             40$:
1381 005652  052737  040000  177744    1$:     BIS     #BIT14,CME      ;WRITE 1 INTO BIT14
1382 005660  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     005662  000240                             NOP                     ;FOR  LOOP ON ERROR
1383 005664  032737  040000  177744            BIT     #BIT14,CME      ;CHECK FOR 0
1384 005672  001403                             BEQ     10$             ;PASS
1385 005674  104406                             ERROR                   ;ERROR
                                                                        ;-----
     005676  005674                             .WORD   .-2
1386                                                                    ;CME UNUSED BIT TEST
1387                                                                    ;READ 1 FROM UNUSED CME BIT14
1388 005700  000000                             .WORD   0
1389 005702  000240                     10$:    NOP                     ;END OF TEST
     005704  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

TEST # 47 - CACHE CONTROL REGISTER BYTE TESTS (CCR)

```
1395                                    .SBTTL  TEST # 47 - CACHE CONTROL REGISTER BYTE TESTS (CCR)
                                        ;;*********************************************************************
                                        ;*TEST 47 - CACHE CONTROL REGISTER BYTE TESTS (CCR)
                                        ;*      REGISTER BYTE SELECTION LOGIC TEST
                                        ;*      WRITE ONE INTO LOW BYTE WRITE ZERO INTO HIGH BYTE
                                        ;*      VERIFY THAT LOW BYTE DATA IS NOT EFFECTED BY WRITE TO HIGH BYTE
                                        ;;*********************************************************************
     005710                             TST47:
1396 005710  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     005712  005722                             .WORD   40$             ;TEST START LOCATION
     005714  005722                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     005716  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     005720  005736                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     005722                             40$:
1397 005722  152737  000004  177746    1$:     BISB    #BIT02,CCR      ;WRITE 1 INTO CONTROL REGISTER BIT02
1398 005730  142737  000004  177747            BICB    #BIT02,CCR+1    ;WRITE 0 INTO CONTROL REGISTER BIT10
1399 005736  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     005740  000240                             NOP                     ;FOR  LOOP ON ERROR
1400 005742  032737  000004  177746            BIT     #BIT02,CCR      ;CHECK FOR 1
1401 005750  001003                             BNE     10$             ;PASS
1402 005752  104406                             ERROR                   ;ERROR
                                                                        ;-----
     005754  005752                             .WORD   .-2
1403                                                                    ;CACHE CONTROL REGISTER BYTE TESTS
1404                                                                    ;WROTE ONE INTO LOW BYTE BIT02
1405                                                                    ;WROTE ZERO INTO HIGH BYTE BIT10
1406                                                                    ;READ ZERO FROM BIT02
1407 005756  000000                             .WORD   0
1408 005760  000240                     10$:    NOP                     ;END OF TEST
     005762  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
1413                                    .SBTTL  TEST # 50 - SET TOP BYTE, CLEAR LOW BYTE OF CCR
                                        ;;*****************************************************************
                                        ;*TEST 50 - SET TOP BYTE, CLEAR LOW BYTE OF CCR
                                        ;*      WRITE ZERO INTO HIGH BYTE WRITE ONE INTO LOW BYTE
                                        ;*      VERIFY HIGH BYTE NOT EFFECTED BY WRITE INTO LOW BYTE
                                        ;;*****************************************************************
     005766                             TST50:
1414 005766  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     005770  006000                             .WORD   40$             ;TEST START LOCATION
     005772  006000                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     005774  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     005776  006014                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     006000                             40$:
1415 006000  142737  000004  177747    1$:     BICB    #BIT02,CCR+1    ;WRITE 0 INTO CONTROL REGISTER BIT10
1416 006006  152737  000004  177746            BISB    #BIT02,CCR      ;WRITE 1 INTO CONTROL REGISTER BIT02
1417 006014  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     006016  000240                             NOP                     ;FOR  LOOP ON ERROR
1418 006020  032737  002000  177746            BIT     #BIT10,CCR      ;CHECK FOR 0 BIT10
1419 006026  001403                             BEQ     10$             ;PASS
1420 006030  104406                             ERROR                   ;ERROR
                                                                        ;-----
     006032  006030                             .WORD   .-2
1421                                                                    ;CACHE CONTROL REGISTER BYTE TESTS
1422                                                                    ;WROTE ZERO INTO HIGH BYTE BIT10
1423                                                                    ;WROTE ONE INTO LOW BYTE BIT02
1424                                                                    ;READ ZERO FROM BIT02 OR READ ONE FROM BIT10
1425 006034  000000                             .WORD   0
1426 006036  000240                     10$:    NOP                     ;END OF TEST
     006040  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
1430                                    .SBTTL  TEST # 51 - CACHE MAINTENANCE REGISTER DATA TEST (CMR)
                                        ;;*********************************************************************
                                        ;*TEST 51 - CACHE MAINTENANCE REGISTER DATA TEST (CMR)
                                        ;*      VERIFY CMR BIT00(TDAR) CAN BE WRITTEN TO A 0
                                        ;;*********************************************************************
     006044                             TST51:
1431 006044  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     006046  006056                             .WORD   40$             ;TEST START LOCATION
     006050  006056                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     006052  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     006054  006070                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     006056                             40$:
1432 006056  042737  000001  177750    1$:     BIC     #BIT00,CMR      ;WRITE 0 INTO CMR BIT00
1433 006064  013700  177750                    MOV     CMR,R0          ;SAVE CONTENTS OF CMR
1434 006070  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     006072  000240                             NOP                     ;FOR  LOOP ON ERROR
1435 006074  005037  177750                    CLR     CMR             ;CLR MAINT
1436 006100  032700  000001                    BIT     #BIT00,R0       ;CHECK FOR 0 IN BIT00
1437 006104  001403                            BEQ     10$             ;PASS
1438 006106  104406                            ERROR                   ;ERROR
                                                                        ;-----
     006110  006106                             .WORD   .-2
1439                                                                    ;MAINTENANCE REGISTER DATA TEST
1440                                                                    ;WROTE 0 INTO CMR BIT00; READ 1
1441 006112  000000                             .WORD   0
1442 006114  000240                     10$:    NOP                     ;END OF TEST
     006116  005237  001472                    INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
1446                                    .SBTTL  TEST # 52 - TEST CMR BIT 0
                                        ;;*************************************************************************
                                        ;*TEST 52 - TEST CMR BIT 0
                                        ;*      VERIFY CMR BIT00(TDAR) CAN BE WRITTEN TO A 1
                                        ;;*************************************************************************
     006122                             TST52:
1447 006122  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     006124  006134                             .WORD   40$             ;TEST START LOCATION
     006126  006134                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     006130  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     006132  006146                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     006134                             40$:
1448 006134  052737  000001  177750    1$:     BIS     #BIT00,CMR      ;WRITE 1 INTO CMR BIT00
1449 006142  013700  177750                    MOV     CMR,R0          ;SAVE CONTENTS OF CMR
1450 006146  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     006150  000240                             NOP                     ;FOR  LOOP ON ERROR
1451 006152  005037  177750                    CLR     CMR             ;CLR MAINT
1452 006156  032700  000001                    BIT     #BIT00,R0       ;CHECK FOR 1 IN BIT00
1453 006162  001003                            BNE     10$             ;PASS
1454 006164  104406                            ERROR                   ;ERROR
                                                                        ;-----
     006166  006164                             .WORD   .-2
1455                                                                    ;MAINTENANCE REGISTER DATA TEST
1456                                                                    ;WROTE 1 INTO CMR BIT00; READ 0
1457 006170  000000                             .WORD   0
1458 006172  000240                     10$:    NOP                     ;END OF TEST
     006174  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 53 - TEST BIT 1 OF CMR
                                ;;*********************************************************************
                                ;*TEST 53 - TEST BIT 1 OF CMR
                                ;*      VERIFY CMR BIT01(HODO) CAN BE WRITTEN AS A 0.
                                ;;*********************************************************************
      006200                    TST53:
1463  006200  000004                   SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                ;ERROR/LOOP ON TEST
      006202  006212                   .WORD   40$             ;TEST START LOCATION
      006204  006212                   .WORD   1$              ;LOOP ON ERROR START LOCATION
      006206  000000                   .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
      006210  006224                   .WORD   25$             ;LOOP ON ERROR END LOCATION
      006212                    40$:
1464  006212  042737  000002  177750  1$:     BIC     #BIT01,CMR      ;WRITE 0 INTO CMR BIT01
1465  006220  013700  177750          MOV     CMR,R0          ;SAVE CONTENTS OF CMR
1466  006224  000240                25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
      006226  000240                NOP                     ;FOR  LOOP ON ERROR
1467  006230  005037  177750          CLR     CMR             ;CLR MAINT
1468  006234  032700  000002          BIT     #BIT01,R0       ;CHECK FOR 0 IN BIT01
1469  006240  001403                BEQ     10$             ;PASS
1470  006242  104406                ERROR                   ;ERROR
                                                                ;-----
      006244  006242                   .WORD   .-2
1471                                                            ;MAINTENANCE REGISTER DATA TEST
1472                                                            ;WROTE 0 INTO CMR BIT01; READ 1
1473  006246  000000                   .WORD   0
1474  006250  000240                10$:    NOP                     ;END OF TEST
      006252  005237  001472          INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
1478                                    .SBTTL  TEST # 54 - TEST CMR BIT 1
                                        ;;*****************************************************************
                                        ;*TEST 54 - TEST CMR BIT 1
                                        ;*      VERIFY CMR BIT01(HODO) CAN BE WRITTEN AS A 1.
                                        ;;*****************************************************************
     006256                             TST54:
1479 006256  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     006260  006270                             .WORD   40$             ;TEST START LOCATION
     006262  006270                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     006264  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     006266  006302                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     006270                             40$:
1480 006270  052737  000002  177750    1$:     BIS     #BIT01,CMR      ;WRITE 1 INTO CMR BIT01
1481 006276  013700  177750                    MOV     CMR,R0          ;SAVE CONTENTS OF CMR
1482 006302  000240                    25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     006304  000240                            NOP                     ;FOR  LOOP ON ERROR
1483 006306  005037  177750                    CLR     CMR             ;CLR MAINT
1484 006312  032700  000002                    BIT     #BIT01,R0       ;CHECK FOR 1 IN BIT01
1485 006316  001003                            BNE     10$             ;PASS
1486 006320  104406                            ERROR                   ;ERROR
                                                                        ;-----
     006322  006320                            .WORD   .-2
1487                                                                    ;MAINTENANCE REGISTER DATA TEST
1488                                                                    ;WROTE 1 INTO CMR BIT01; READ 0
1489 006324  000000                            .WORD   0
1490 006326  000240                    10$:    NOP                     ;END OF TEST
     006330  005237  001472                    INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
1494                                    .SBTTL  TEST # 55 - TEST CMR BIT 3
                                        ;;*****************************************************************
                                        ;*TEST 55 - TEST CMR BIT 3
                                        ;*        VERIFY CMR BIT03(AM) CAN BE WRITTEN AS A 0.
                                        ;;*****************************************************************
     006334                             TST55:
1495 006334  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     006336  006346                             .WORD   40$             ;TEST START LOCATION
     006340  006346                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     006342  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     006344  006372                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     006346                             40$:
1496 006346  012737  177777  177752    1$:     MOV     #-1,CHR         ;ALL 1'S TO AMR
1497 006354  112737  000374  177751            MOVB    #374,CMR+1
1498 006362  105037  177750                     CLRB    CMR             ;WRITE 0 INTO CMR BIT03
1499 006366  013700  177750                     MOV     CMR,R0          ;SAVE CONTENTS OF CMR
1500 006372  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     006374  000240                             NOP                     ;FOR  LOOP ON ERROR
1501 006376  005037  177750                     CLR     CMR             ;CLR MAINT
1502 006402  032700  000010                     BIT     #BIT03,R0       ;CHECK FOR 0 IN BIT03
1503 006406  001403                             BEQ     10$             ;PASS
1504 006410  104406                             ERROR                   ;ERROR
                                                                        ;-----
     006412  006410                             .WORD   .-2
1505                                                                    ;MAINTENANCE REGISTER DATA TEST
1506                                                                    ;WROTE 0 INTO CMR BIT03; READ 1
1507 006414  000000                             .WORD   0
1508 006416  000240                     10$:    NOP                     ;END OF TEST
     006420  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
1512                                    .SBTTL  TEST # 56 - TEST CMR BIT 3
                                        ;;*****************************************************************
                                        ;*TEST 56 - TEST CMR BIT 3
                                        ;*      VERIFY BIT03(AM) CAN BE WRITTEN AS A 1.
                                        ;;*****************************************************************
     006424                             TST56:
1513 006424  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     006426  006436                             .WORD   40$             ;TEST START LOCATION
     006430  006436                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     006432  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     006434  006470                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     006436                             40$:
1514 006436  012737  177777  177752    1$:     MOV     #-1,CHR
1515 006444  112737  000374  177751            MOVB    #374,CMR+1
1516 006452  105037  177750                     CLRB    CMR             ;PRECONDITION AM BIT TO 0
1517 006456  112737  000010  177750            MOVB    #AM,CMR         ;WRITE 1 INTO AM BIT
1518 006464  013700  177750                     MOV     CMR,R0          ;SAVE CONTENTS OF CMR
1519 006470  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     006472  000240                             NOP                     ;FOR  LOOP ON ERROR
1520 006474  005037  177750                     CLR     CMR             ;CLR MAINT
1521 006500  032700  000010                     BIT     #BIT03,R0       ;CHECK FOR 1 IN BIT03
1522 006504  001003                             BNE     10$             ;PASS
1523 006506  104406                             ERROR                   ;ERROR
                                                                        ;-----
     006510  006506                             .WORD   .-2
1524                                                                    ;MAINTENANCE REGISTER DATA TEST
1525                                                                    ;WROTE 1 INTO CMR BIT03; READ 0
1526 006512  000000                             .WORD   0
1527 006514  000240                     10$:    NOP                     ;END OF TEST
     006516  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                        .SBTTL  TEST # 57 - TEST UNUSED BIT 5 IN THE CMR
                                        ;;*****************************************************************
                                        ;*TEST 57 - TEST UNUSED BIT 5 IN THE CMR
                                        ;*      ATTEMPT WRITE 1 INTO ALL UNUSED BITS OF CMR. ALL
                                        ;*      BITS SHOULD READ 0.
                                        ;;*****************************************************************
      006522
1533  006522  000004                   TST57:  SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
      006524  006534                           .WORD   40$             ;TEST START LOCATION
      006526  006534                           .WORD   1$              ;LOOP ON ERROR START LOCATION
      006530  000000                           .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
      006532  006542                           .WORD   25$             ;LOOP ON ERROR END LOCATION
      006534                           40$:
1534  006534  052737  000040  177750  1$:     BIS     #BIT05,CMR      ;WRITE 1 INTO BIT05
1535  006542  000240                   25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
      006544  000240                           NOP                     ;FOR  LOOP ON ERROR
1536  006546  032737  000040  177750          BIT     #BIT05,CMR      ;CHECK FOR 0
1537  006554  001403                           BEQ     10$             ;PASS
1538  006556  104406                           ERROR                   ;ERROR
                                                                        ;-----
      006560  006556                           .WORD   .-2
1539
1540                                                                    ;CMR UNUSED BIT TEST
                                                                        ;READ 1 FROM UNUSED CMR BIT05
1541  006562  000000                           .WORD   0
1542  006564  000240                   10$:    NOP                     ;END OF TEST
      006566  005237  001472                   INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
1543                                    .SBTTL  TEST # 60 - TEST UNUSED BIT 6 IN THE CMR
                                        ;;*****************************************************************
                                        ;*TEST 60 - TEST UNUSED BIT 6 IN THE CMR
                                        ;;*****************************************************************
     006572                             TST60:
1544 006572  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     006574  006604                             .WORD   40$             ;TEST START LOCATION
     006576  006604                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     006600  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     006602  006612                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     006604                             40$:
1545 006604  052737  000100  177750    1$:     BIS     #BIT06,CMR      ;WRITE 1 INTO BIT06
1546 006612  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     006614  000240                             NOP                     ;FOR  LOOP ON ERROR
1547 006616  032737  000100  177750            BIT     #BIT06,CMR      ;CHECK FOR 0
1548 006624  001403                             BEQ     10$             ;PASS
1549 006626  104406                             ERROR                   ;ERROR
                                                                        ;-----
     006630  006626                             .WORD   .-2
1550                                                                    ;CMR UNUSED BIT TEST
1551                                                                    ;READ 1 FROM UNUSED CMR BIT02
1552 006632  000000                             .WORD   0
1553 006634  000240                     10$:    NOP                     ;END OF TEST
     006636  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

TEST # 61 - TEST UNUSED BIT 7 IN THE CMR

```
1554                                    .SBTTL  TEST # 61 - TEST UNUSED BIT 7 IN THE CMR
                                        ;;*********************************************************************
                                        ;*TEST 61 - TEST UNUSED BIT 7 IN THE CMR
                                        ;;*********************************************************************
     006642                             TST61:
1555 006642  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     006644  006654                             .WORD   40$             ;TEST START LOCATION
     006646  006654                             .WORD   1$              ;LOOP ON ERROR START LOCATION
     006650  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     006652  006662                             .WORD   25$             ;LOOP ON ERROR END LOCATION
     006654                             40$:
1556 006654  052737  000200  177750    1$:     BIS     #BIT07,CMR      ;WRITE 1 INTO BIT07
1557 006662  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     006664  000240                             NOP                     ;FOR  LOOP ON ERROR
1558 006666  032737  000200  177750            BIT     #BIT07,CMR      ;CHECK FOR 0
1559 006674  001403                             BEQ     10$             ;PASS
1560 006676  104406                             ERROR                   ;ERROR
                                                                        ;-----
     006700  006676                             .WORD   .-2
1561                                                                    ;CMR UNUSED BIT TEST
1562                                                                    ;READ 1 FROM UNUSED CMR BIT03
1563 006702  000000                             .WORD   0
1564 006704  000240                     10$:    NOP                     ;END OF TEST
     006706  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
TEST # 62 - TEST AMR
  1571                                  .SBTTL  TEST # 62 - TEST AMR
                                        ;;*************************************************************************
                                        ;*TEST 62 - TEST AMR
                                        ;*      MA<21:0> ADDRESS LINES ALL 1'S
                                        ;*      CA<21:0> ADDRESS LINES ALL 0'S
                                        ;*      AMR<21:0> DATA LINES ALL 0'S
                                        ;*      AM BIT SHOULD READ 1.
                                        ;;*************************************************************************
       006712
  1572 006712  000004                   TST62:  SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
       006714  006724                           .WORD   40$             ;TEST START LOCATION
       006716  006724                           .WORD   1$              ;LOOP ON ERROR START LOCATION
       006720  000000                           .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
       006722  006764                           .WORD   25$             ;LOOP ON ERROR END LOCATION
       006724                           40$:
  1573 006724  012737  177777  177752  1$:     MOV     #-1,CHR         ;ALL 1'S TO AMR
  1574 006732  112737  000374  177751          MOVB    #374,CMR+1
  1575 006740  105037  177750                   CLRB    CMR             ;PRECONDITION AM BIT TO 0
  1576 006744  005037  177752                   CLR     CHR             ;ALL 0'S TO AMR<21:0>
  1577 006750  105037  177751                   CLRB    CMR+1
  1578 006754  005737  000000                   TST     0               ;PLACE ALL 0'S ON CA<21:0>.HOWEVER,
  1579                                                                  ;THIS IS NOT WHEN THE AM BIT IS SET:
  1580                                                                  ;WHEN PAX ADDRESS LINES ARE NOT BEING
  1581                                                                  ;ACCESSED BY THE CPU, THE CACHE DEFAULTS
  1582                                                                  ;TO SELECTING MA<21:0> ADDRESS LINES.
  1583                                                                  ;IN THIS SITUATION, MA<21:0> DEFAULTS
  1584                                                                  ;TO ALL 1'S THEREBY PLACING ALL 0'S
  1585                                                                  ;ON CA<21:0>.  THEREFORE, FOLLOWING THE LOADING
  1586                                                                  ;OF ALL 0'S INTO AMR<21:0>,AND BEFORE THE
  1587                                                                  ;'TST 0' INSTRUCTION, THE AM BIT SHOULD
  1588                                                                  ;BE SET DUE TO MATCH BETWEEN AMR<21:0> AND CA<21:0>
  1589                                                                  ; ADDRESS LINES.
  1590 006760  013703  177750                   MOV     CMR,R3          ;SAVE AM BIT RESULT IN CMR
  1591 006764  000240                   25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
       006766  000240                           NOP                     ;FOR  LOOP ON ERROR
  1592 006770  032703  000010                   BIT     #AM,R3          ;AM BIT SHOULD READ 1 INDICATING MATCH
  1593 006774  001003                           BNE     10$             ;PASS
  1594 006776  104406                           ERROR                   ;ERROR
                                                                        ;-----
       007000  006776                           .WORD   .-2
  1595                                                                  ;AMR TESTS
  1596                                                                  ;AMR BIT DID NOT READ 1 INDICATING
  1597                                                                  ;A MATCH OF ALL 0'S BETWEEN MA TO CA<21:0>
  1598                                                                  ;ADDRESS LINES AND AMR<21:0> DATA
  1599 007002  000000                           .WORD   0               ;ERROR PRINT TERMIN.
  1600 007004  000240                   10$:    NOP                     ;END OF TEST
       007006  005237  001472                   INC     $TESTN          ;INCREMENT TEST COUNTER
  1601                                          .SBTTL  MEMORY MANAGEMENT AND UNIBUS MAP REGISTERS SETUP
  1602
  1603                                  ;;*************************************************************************
  1604                                  ;*      MEMORY MANAGEMENT SETUP
  1605                                  ;;*************************************************************************
  1606 007012  012737  077406  172300  MAGPRE: MOV     #77406,KPDR0    ;ALLOW ALL ACCESS TO KERNEL PAGE 0
  1607 007020  012737  077406  172302          MOV     #77406,KPDR1    ;ALLOW ALL ACCESS TO KERNEL PAGE 1
  1608 007026  012737  077406  172304          MOV     #77406,KPDR2    ;ALLOW ALL ACCESS TO KERNEL PAGE 2
  1609 007034  012737  077406  172306          MOV     #77406,KPDR3    ;ALLOW ALL ACCESS TO KERNEL PAGE 3
```

```
 1610 007042  012737  077406  172310          MOV     #77406,KPDR4    ;ALLOW ALL ACCESS TO KERNEL PAGE 4
 1611 007050  012737  077406  172312          MOV     #77406,KPDR5    ;ALLOW ALL ACCESS TO KERNEL PAGE 5
 1612 007056  012737  077406  172314          MOV     #77406,KPDR6    ;ALLOW ALL ACCESS TO KERNEL PAGE 6
 1613 007064  012737  077406  172316          MOV     #77406,KPDR7    ;ALLOW ALL ACCESS TO KERNEL PAGE 7
 1614 007072  005037  172340                  CLR     KPAR0           ;MAP PAGE 0 FOR 0-4K
 1615 007076  012737  000200  172342          MOV     #200,KPAR1      ;MAP PAGE 1 FOR 4-8K
 1616 007104  012737  000400  172344          MOV     #400,KPAR2      ;MAP PAGE 2 FOR 8-12K
 1617 007112  012737  000600  172346          MOV     #600,KPAR3      ;MAP PAGE 3 FOR 12-16K
 1618 007120  012737  177600  172356          MOV     #177600,KPAR7   ;MAP PAGE 7 FOR 124-128K
 1619
 1620                                  ;;*****************************************************************
 1621                                  ;*      UNIBUS MAP REGISTERS SETUP
 1622                                  ;;*****************************************************************
 1623 007126  012737  000000  170200          MOV     #0,UMPR00       ;MAP REGISTER SET 0 FOR 0-4K
 1624 007134  012737  000000  170202          MOV     #0,UMPR01
 1625 007142  012737  020000  170204          MOV     #20000,UMPR02   ;MAP REGISTER SET 1 FOR 4K-8K
 1626 007150  012737  000000  170206          MOV     #0,UMPR03
 1627 007156  012737  040000  170210          MOV     #40000,UMPR04   ;MAP REGISTER SET 2 FOR 8K-12K
 1628 007164  012737  000000  170212          MOV     #0,UMPR05
 1629 007172  012737  060000  170214          MOV     #60000,UMPR06   ;MAP REGISTER SET 3 FOR 12K-16K
 1630 007200  012737  000000  170216          MOV     #0,UMPR07
```

```
                                                        .SBTTL  TEST # 63 - AMR CHECK
                                                        ;;*****************************************************************
                                                        ;*TEST 63 - AMR CHECK
                                                        ;*      MA<21:0> ADDRESS LINES ALL 0'S
                                                        ;*      CA<21:0> ADDRESS LINES ALL 1'S
                                                        ;*      AMR<21:0> DATA LINES ALL 1'S
                                                        ;*           AM BIT SHOULD READ 1.
                                                        ;;*****************************************************************
                                                        ;
                                                        TST63:
  007206
1638 007206  000004                                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                                        ;ERROR/LOOP ON TEST
       007210  007220                                           .WORD   40$             ;TEST START LOCATION
       007212  007220                                           .WORD   1$              ;LOOP ON ERROR START LOCATION
       007214  000000                                           .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
       007216  007244                                           .WORD   25$             ;LOOP ON ERROR END LOCATION
       007220                                           40$:
1639 007220  012737  177777  177752                    1$:     MOV     #-1,CHR         ;LOAD AMR<15:0> WITH 1'S FROM CHR<15:0>
1640 007226  112737  000374  177751                            MOVB    #374,CMR+1      ;LOAD AMR<21:16> ALL 1'S
1641 007234  105037  177750                                    CLRB    CMR             ;PRECONDITION AM BIT TO 0
1642 007240  105737  177777                                    TSTB    177777          ;PUT ALL 1'S ON MA AND PA ADDRESS LINES
1643                                                                                    ;MA WILL BE SELECTED
1644 007244  000240                                    25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
       007246  000240                                           NOP                     ;FOR  LOOP ON ERROR
1645 007250  032737  000010  177750                            BIT     #AM,CMR         ;AM BIT SHOULD READ 1 INDICATING MATCH
1646 007256  001003                                            BNE     10$             ;PASS
1647 007260  104406                                            ERROR                   ;ERROR
                                                                                        ;-----
       007262  007260                                           .WORD   .-2
1648                                                                                    ;AMR TESTS
1649                                                                                    ;AMR BIT DID NOT READ 1 INDICATING
1650                                                                                    ;A MATCH OF ALL 1'S BETWEEN CA<21:0>
1651                                                                                    ;ADRESS LINES AND AMR<21:0> DATA
1652 007264  000000                                            .WORD   0               ;ERROR PRINT TERMIN.
1653 007266  000240                                    10$:    NOP                     ;END OF TEST
       007270  005237  001472                                  INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
1660                                    .SBTTL  TEST # 64 - AMR LINES NOT SHORTED & NOT SHORTED TO CA LINES
                                        ;;*****************************************************************
                                        ;*TEST 64 - AMR LINES NOT SHORTED & NOT SHORTED TO CA LINES
                                        ;*      MA<21:0> ADDRESS LINES ALL 1'S
                                        ;*      CA<21:0> ADDRESS LINES ALL 0'S
                                        ;*      AMR<15:0> FLOATING 1 PATTERN
                                        ;*           FOR EACH FLOATING 1 PATTERN  AM BIT SHOULD READ 0.
                                        ;;*****************************************************************
     007274                             TST64:
1661 007274  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     007276  007306                             .WORD   40$             ;TEST START LOCATION
     007300  060006                             .WORD   1$-40$+57764    ;LOOP ON ERROR START LOCATION
     007302  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     007304  060034                             .WORD   25$-40$+57764   ;LOOP ON ERROR END LOCATION
     007306  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     007314  004437  002342                     JSR     R4,RELCTL       ;LOCATE TEST CODE TO LOW CACHE SPACE
     007320  007466                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO LOW CACHE SPACE

1662 007322  012737  000001  002066             MOV     #1,CHRPAT       ;SETUP 1ST PATTERN FOR CHR<15:0>
1663 007330  013737  002066  177752  1$:        MOV     CHRPAT,CHR      ;LOAD AMR<15:0> FROM CHR<15:0>
1664 007336  105037  177751                     CLRB    CMR+1           ;LOAD AMR<21:16> FROM CMR<15:10>
1665 007342  105037  177750                     CLRB    CMR             ;PRECONDITION AM BIT TO 0
1666 007346  005737  000000                     TST     0               ;PLACE ALL 0'S ON CA<21:0>.
1667                                                                    ;WHEN PAX ADDRESS LINES ARE NOT BEING
1668                                                                    ;ACCESSED BY THE CPU, THE CACHE DEFAULTS
1669                                                                    ;TO SELECTING MA<21:0> ADDRESS LINES.
1670                                                                    ;IN THIS SITUATION, MA<21:0> DEFAULTS
1671                                                                    ;TO ALL 1'S THEREBY PLACING ALL 0'S
1672                                                                    ;ON CA<21:0>.  THEREFORE, FOLLOWING THE LOADING
1673                                                                    ;OF ALL 0'S INTO AMR<21:0>,AND BEFORE THE
1674                                                                    ;'TST 0' INSTRUCTION,ALL 0'S ARE PLACED
1675                                                                    ; ON CA<21:0> ADDRESS LINES.
1676 007352  013703  177750                     MOV     CMR,R3          ;SAVE AM BIT RESULT IN CMR
1677 007356  000240                25$:        NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     007360  000240                             NOP                     ;FOR  LOOP ON ERROR
1678 007362  032703  000010                     BIT     #AM,R3          ;CHECK FOR 0.
1679 007366  001432                             BEQ     9$              ;PASS
1680 007370  005037  047314                     CLR     CA210+2         ;PREPARE CA210 FOR TYPEOUT
1681 007374  005037  047312                     CLR     CA210
1682 007400  013737  002066  047320             MOV     CHRPAT,AMR210+2 ;PREPARE PATTERN USED FOR AMR<21:0>
1683                                                                    ;FOR ERROR TYPEOUT
1684 007406  013737  002066  047316             MOV     CHRPAT,AMR210
1685 007414  012737  000017  002062             MOV     #15.,LOOP
1686 007422  006237  047316        3$:          ASR     AMR210
1687 007426  042737  100000  047316             BIC     #100000,AMR210
1688 007434  005337  002062                     DEC     LOOP
1689 007440  001370                             BNE     3$
1690 007442  104406                             ERROR                   ;ERROR
                                                                        ;-----
     007444  007442                             .WORD   .-2
1691                                                                    ;AMR TESTS
1692                                                                    ;AM BIT SHOULD HAVE READ 0 INDICATING A
1693                                                                    ;NO-MATCH CONDITION.
```

```
1694 007446  047312                        CA210                ;PRINT PATTERN USED FOR CACHE ADDRESS LINES CA<21:0>
1695 007450  047316                        AMR210               ;PRINT FLOATING 1 PATTERN USED FOR AMR<21:0> DATA
1696 007452  000000                        .WORD   0
1697 007454  006337  002066          9$:   ASL     CHRPAT       ;NEXT FLOATING 1 PATTERN
1698 007460  103401                        BCS     10$          ;IF PHYSICAL ADDRESS 100000 DONE;THEN FINISHED
1699 007462  000722                        BR      1$           ;IF NOT CONTINUE WITH NXT PATTERN
1700 007464  000240                  10$:  NOP                  ;END OF TEST
     007466  005237  001472                INC     $TESTN       ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 65 - FLOATING BIT TEST OF AM
                                ;;*****************************************************************
                                ;*TEST 65 - FLOATING BIT TEST OF AM
                                ;*      MA<21:0> ADDRESS LINES ALL 1'S
                                ;*      CA<21:0> ADDRESS LINES ALL 0'S
                                ;*      AMR<21:16> FLOATING 1 PATTERN
                                ;*          FOR EACH FLOATING 1 PATTERN  AM BIT SHOULD READ 0.
                                ;;*****************************************************************
     007472                     TST65:
1708 007472  000004                     SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                ;ERROR/LOOP ON TEST
     007474  007504                     .WORD   40$             ;TEST START LOCATION
     007476  060006                     .WORD   1$-40$+57764    ;LOOP ON ERROR START LOCATION
     007500  000000                     .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     007502  060034                     .WORD   25$-40$+57764   ;LOOP ON ERROR END LOCATION
     007504  012737  001015  177746 40$: MOV     #OFF,CCR        ;DISABLE CACHE
     007512  004437  002342             JSR     R4,RELCTL       ;LOCATE TEST CODE TO LOW CACHE SPACE
     007516  007646                     .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO LOW CACHE SPACE

1709 007520  012737  000004  002064      MOV     #4,CMRPAT       ;SETUP 1ST PATTERN FOR CMR<21:16>
1710 007526  113737  002064  177751 1$:  MOVB    CMRPAT,CMR+1    ;LOAD AMR<21:16> FROM CMR<15:10>
1711 007534  005037  177752             CLR     CHR             ;LOAD ALL 0'S TO AMR<15:0> FROM CHR<15:0>
1712 007540  105037  177750             CLRB    CMR             ;PRECONDITION AM BIT TO 0
1713 007544  005737  000000             TST     0               ;SAVE CMR CONTENTS.  BEFORE THE FETCH
1714                                                            ;OF THIS INSTRUCTION, ALL 0'S WILL
1715                                                            ;BE PLACED ON CA<21:0> LINES.
1716 007550  013703  177750             MOV     CMR,R3          ;SAVE CMR CONTENTS
1717 007554  000240             25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     007556  000240                     NOP                     ;FOR  LOOP ON ERROR
1718 007560  032703  000010             BIT     #AM,R3          ;CHECK FOR 0.
1719 007564  001420                     BEQ     9$              ;PASS
1720 007566  005037  047314             CLR     CA210+2         ;PREPARE CA210 FOR PRINTOUT
1721 007572  005037  047312             CLR     CA210
1722 007576  005037  047320             CLR     AMR210+2        ;PREPARE PATTERN USED FOR AMR<21:0>
1723 007602  013737  002064  047316     MOV     CMRPAT,AMR210
1724 007610  006237  047316             ASR     AMR210
1725 007614  104406                     ERROR                   ;ERROR
                                                                ;-----
     007616  007614                     .WORD   .-2
1726                                                            ;AMR TESTS
1727                                                            ;AM BIT SHOULD HAVE READ 0 INDICATING A
1728                                                            ;NO-MATCH CONDITION.
1729 007620  047312                     CA210                   ;PRINT PATTERN USED FOR CACHE ADDRESS LINES CA<21:0>
1730 007622  047316                     AMR210                  ;PRINT FLOATING 1 PATTERN USED FOR AMR<21:0> DATA
1731 007624  000000                     .WORD   0
1732 007626  006337  002064         9$: ASL     CMRPAT          ;NEXT FLOATING 1 PATTERN
1733 007632  032737  000400  002064     BIT     #400,CMRPAT     ;IF PHYSICAL ADDRESS 10000000 DONE;FINISHED
1734 007640  001001                     BNE     10$
1735 007642  000731                     BR      1$              ;IF NOT CONTINUE WITH NXT PATTERN
1736 007644  000240             10$:    NOP                     ;END OF TEST
     007646  005237  001472             INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
TEST # 66 - VERIFY NO MA TO CA LINES ARE SHORT TO EACH OTHER
   1743                                 .SBTTL  TEST # 66 - VERIFY NO MA TO CA LINES ARE SHORT TO EACH OTHER
                                        ;;*****************************************************************
                                        ;*TEST 66 - VERIFY NO MA TO CA LINES ARE SHORT TO EACH OTHER
                                        ;*      MA<12:0> ADDRESS LINES FLOATING 0
                                        ;*      CA<12:0> ADDRESS LINES FLOATING 1
                                        ;*      AMR<12:0> FLOATING 1 PATTERN
                                        ;*      AM BIT READS 1
                                        ;;*****************************************************************
        007652                          TST66:
   1744 007652  000004                          SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
        007654  007664                          .WORD   40$             ;TEST START LOCATION
        007656  060020                          .WORD   1$-40$+57764    ;LOOP ON ERROR START LOCATION
        007660  000000                          .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
        007662  060114                          .WORD   25$-40$+57764   ;LOOP ON ERROR END LOCATION
        007664  012737  001015  177746  40$:    MOV     #OFF,CCR        ;DISABLE CACHE
        007672  004437  002342                  JSR     R4,RELCTL       ;LOCATE TEST CODE TO LOW CACHE SPACE
        007676  010112                          .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO LOW CACHE SPACE

   1745 007700  012737  000001  047344          MOV     #1,FLTPAT       ;1ST FLOATING 1 PATTERN: 00001
   1746 007706  012701  100001                  MOV     #100001,R1      ;LOAD VIRTUAL ADDRESS. SELECTS KPAR4
   1747                                                                 ;AND SPECIFIES OFFSET FOR PHYSICAL ADDRESS.
   1748 007712  012737  170000  172350          MOV     #170000,KPAR4   ;MAP PAGE 4 FOR TOP 124K ADDRESSING.
   1749                                                                 ;TOGETHER WITH VIRTUAL ADDRESS WILL
   1750                                                                 ;PLACE 17000001 ON PA LINES AND
   1751                                                                 ;00000001 ON MA LINES FOR 1ST FLOATING
   1752                                                                 ;1 PATTERN.
   1753 007720  012737  000001  177572  1$:     MOV     #1,SR0          ;ENABLE MEM. MNGMENT.
   1754 007726  012737  000020  172516          MOV     #20,SR3         ;ENABLE 22-BIT MAPPING
   1755 007734  013737  047344  177752          MOV     FLTPAT,CMR      ;LOAD AMR WITH FLOATING 1 PATTERN
   1756 007742  105037  177751                  CLRB    CMR+1
   1757 007746  105037  177750                  CLRB    CMR             ;PRECONDITION AM BIT TO 0
   1758 007752  023727  047344  000001          CMP     FLTPAT,#1       ;FOR 1ST PATTERN USE TSTB
   1759 007760  001004                          BNE     2$
   1760 007762  105711                          TSTB    (R1)            ;
   1761 007764  000240                          NOP
   1762 007766  000240                          NOP
   1763 007770  000403                          BR      4$
   1764 007772  005711                  2$:     TST     (R1)            ;
   1765 007774  000240                          NOP
   1766 007776  000240                          NOP
   1767 010000  013703  177750          4$:     MOV     CMR,R3
   1768 010004  005037  177572                  CLR     SR0             ;DISABLE MEM. MNGMNT.
   1769 010010  005037  172516                  CLR     SR3
   1770 010014  000240                  25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
        010016  000240                          NOP                     ;FOR  LOOP ON ERROR
   1771 010020  032703  000010                  BIT     #AM,R3          ;CHECK FOR 1
   1772 010024  001017                          BNE     9$              ;PASS
   1773 010026  013737  047344  047320          MOV     FLTPAT,AMR210+2 ;PREPARE PATTERN USED FOR AMR<21:0>
   1774                                                                 ;FOR ERROR TYPEOUT
   1775 010034  005037  047316                  CLR     AMR210
   1776 010040  013737  047344  047314          MOV     FLTPAT,CA210+2  ;PREPARE PATT. USED FOR CA<21:0 > FOR ERROR TYPE
   1777 010046  005037  047312                  CLR     CA210
   1778 010052  104406                          ERROR                   ;ERROR
```

TEST # 66 - VERIFY NO MA TO CA LINES ARE SHORT TO EACH OTHER

```
                                                                        ;-----
      010054  010052                          .WORD   .-2
 1779                                                                   ;AMR TESTS
 1780                                                                   ;AM BIT DID NOT READ 1
 1781 010056  047312                          CA210                     ;PRINT FLOATING 1 PATTERN USED FOR CA<21:0>
 1782 010060  047316                          AMR210                    ;PRINT FLOAT 1 PATTRN. USED FOR AMR<21:0>
 1783 010062  000000                          .WORD   0
 1784 010064  006337  047344          9$:     ASL     FLTPAT            ;NXT PATTERN
 1785 010070  032737  020000  047344          BIT     #20000,FLTPAT     ;IF PATTERN 10000 DONE; FINISHED
 1786 010076  001004                          BNE     10$
 1787 010100  006301                          ASL     R1                ;IF NOT NEXT PASS
 1788 010102  052701  100000                  BIS     #100000,R1
 1789 010106  000704                          BR      1$
 1790 010110  000240                  10$:    NOP                       ;END OF TEST
      010112  005237  001472                  INC     $TESTN            ;INCREMENT TEST COUNTER
```

```
TEST # 67 - AM FLOATING PATTERN TEST
 1797                                   .SBTTL  TEST # 67 - AM FLOATING PATTERN TEST
                                        ;;*****************************************************************
                                        ;*TEST 67 - AM FLOATING PATTERN TEST
                                        ;*      MA<21:13> ADDRESS LINES FLOATING 0
                                        ;*      CA<21:13> ADDRESS LINES FLOATING 1
                                        ;*      AMR<21:13> FLOAT. 1 PATTRN.
                                        ;*      AM BIT READS 1
                                        ;;*****************************************************************
      010116                            TST67:
 1798 010116  000004                            SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
      010120  010130                            .WORD   40$             ;TEST START LOCATION
      010122  060036                            .WORD   1$-40$+57764    ;LOOP ON ERROR START LOCATION
      010124  000000                            .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
      010126  060144                            .WORD   25$-40$+57764   ;LOOP ON ERROR END LOCATION
      010130  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
      010136  004437  002342                    JSR     R4,RELCTL       ;LOCATE TEST CODE TO LOW CACHE SPACE
      010142  010470                            .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO LOW CACHE SPACE

 1799 010144  012737  171000  172350  2$:      MOV     #171000,KPAR4   ;MAP PAGE 4 FOR TOP 124K ADDRESSING
 1800                                                                   ;WILL ALSO  SELECT UNIBUS MAP REGISTER
 1801                                                                   ;SET #4
 1802 010152  012737  000040  047344          MOV     #40,FLTPAT      ;SETUP 1ST PATTERN FOR UMPR09
 1803 010160  012737  020000  170220          MOV     #20000,UMPR08   ;SETUP 1ST PATTERN FOR UMPR08
 1804                                                                   ;ACCESSING TOP 124K,AND ENABLING
 1805                                                                   ;UNIBUS MAP, THE 1ST ADDRESS WILL BE
 1806                                                                   ;CONSTRUCTED  THRU THE PA<21:)>
 1807                                                                   ;LINES AS 17020000 AND AS 00020000
 1808                                                                   ;THRU THE MA<21:0> LINES. DUE TO TOP 124K
 1809                                                                   ;ADDRESSING CA<21:0> WILL SELECT THE MA LINES.
 1810 010166  012737  000200  002064          MOV     #200,CMRPAT     ;SETUP 1ST PATTERN FOR CMR<15:10>
 1811 010174  012737  020000  002066          MOV     #20000,CHRPAT   ;SETUP 1ST PATTERN FOR CHR<15:0>
 1812 010202  012737  060126  000004  1$:      MOV     #3$-2$+60000,4  ;
 1813 010210  012737  000340  000006          MOV     #340,6
 1814 010216  113737  047345  170222          MOVB    FLTPAT+1,UMPR09 ;LOAD UPPER BITS OF UNIBUS MAP REGISTER
 1815 010224  113737  002065  177751          MOVB    CMRPAT+1,CMR+1  ;LOAD AMR<21:16> FROM CMR<15:10>
 1816 010232  013737  002066  177752          MOV     CHRPAT,CHR      ;LOAD AMR<15:0> FROM CHR<15:0>
 1817 010240  012737  000001  177572          MOV     #1,SR0          ;ENABLE MEM MNGMENT
 1818 010246  012737  000060  172516          MOV     #60,SR3         ;ENABLE UNIBUS MAP AND 22-BIT MAPPING
 1819 010254  105037  177750                  CLRB    CMR             ;PRECONDITION AM BIT WITH 0
 1820 010260  005737  100000                  TST     100000          ;TOP 124K ADDRESSING WILL BE DONE PLACING
 1821                                                                   ;THE APPROPRIATE FLOATING 1 ADDRESS PATTERN
 1822                                                                   ;ON CA<21:0>.HOWEVER, THIS IS NOT WHEN THE
 1823                                                                   ;AM BIT IS SET: WHEN PAX ADDRESS LINES ARE
 1824                                                                   ;NOT BEING ACCESSED BY THE CPU,THE CACHE
 1825                                                                   ;DEFAULTS TO SELECTING MA<21:0> ADDRESS
 1826                                                                   ;LINES. IN THIS SITUATION,MA<21:0> DEFAULTS TO
 1827                                                                   ;WHATEVER ADDRESS PATTERN IS BEING SET UP
 1828                                                                   ;VIA THE UNIBUS MAP.
 1829                                                                   ;THEREFORE AFTER THE 'CLRB CMR' INSTRUCTION
 1830                                                                   ;AND BEFORE 'TST 100000' THE AM BIT SHOULD
 1831                                                                   ;BE SET
 1832 010264  000240                  NOP
 1833 010266  000240                  NOP
```

```
                                                BR      4$                      ;NO TRAP
                                        3$:     CMP     (SP)+,(SP)+             ;
                                        4$:     MOV     CMR,R3                  ;SAVE CMR CONTENTS
                                                CLR     SR0
                                                CLR     SR3                     ;DISABLE UNIBUS MAP
                                        25$:    NOP                             ;INSTRUCTION 'JMP 1$' PLACED HERE
                                                NOP                             ;FOR  LOOP ON ERROR
                                                BIT     #AM,R3                  ;CHECK FOR 1
                                                BNE     9$                      ;PASS
                                                MOV     #6,4
                                                CLR     6
                                                MOV     CHRPAT,AMR210+2 ;PREPARE AMR210 AND CA210 FOR PRINTOUT
                                                MOV     CHRPAT,CA210+2
                                                MOV     FLTPAT,AMR210
                                                MOV     FLTPAT,CA210
                                                MOV     #7,LOOP
                                        6$:     ASR     CA210
                                                ASR     AMR210
                                                DEC     LOOP
                                                BNE     6$
                                                ERROR                           ;ERROR
                                                                                ;-----
                                                .WORD   .-2
                                                                                ;AMR TESTS
                                                                                ;AM BIT DIT NOT READ 1
                                                CA210                           ;PRINT CA<21:0> PATTERN USED
                                                AMR210                          ;PRINT AMR<21:0> PAT. USED
                                                0
                                        9$:     ASL     FLTPAT                  ;NEXT PATTERN FOR UMPR01
                                                BIT     #40000,FLTPAT   ;IF ADDRESS PATTERN 10000000 DON; FINISHED
                                                BNE     8$
                                                ASL     UMPR08                  ;NEXT PATTERN FOR UMPR08
                                                ASL     CMRPAT                  ;NEXT PATTERN FOR CMR<15:10>
                                                ASL     CHRPAT                  ;NEXT PATTERN FOR CHR<15:0>
                                                BR      1$
                                        8$:     MOV     #6,4                    ;RESTORE VECTORS
                                                CLR     6
                                        10$:    NOP                             ;END OF TEST
                                                INC     $TESTN                  ;INCREMENT TEST COUNTER
```

```
TEST # 70 - VERIFY NO STUCK PA LINES OR SHORTED TO EACH OTHER
   1875                                 .SBTTL  TEST # 70 - VERIFY NO STUCK PA LINES OR SHORTED TO EACH OTHER
                                        ;;*****************************************************************
                                        ;*TEST 70 - VERIFY NO STUCK PA LINES OR SHORTED TO EACH OTHER
                                        ;*      PA<14:0> ADDRESS LINES FLOATING 1
                                        ;*      CA<14:0> ADDRESS LINES FLOATING 1
                                        ;*               AMR<14:0> FLOATING 1 PATTERN
                                        ;*               AM BIT READS 1
                                        ;;*****************************************************************
     010474                             TST70:
   1876 010474  000004                          SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
        010476  010506                          .WORD   40$             ;TEST START LOCATION
        010500  060004                          .WORD   1$-40$+57764    ;LOOP ON ERROR START LOCATION
        010502  000000                          .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
        010504  060034                          .WORD   25$-40$+57764   ;LOOP ON ERROR END LOCATION
        010506  012737  001015  177746  40$:    MOV     #OFF,CCR        ;DISABLE CACHE
        010514  004437  002342                  JSR     R4,RELCTL       ;LOCATE TEST CODE TO LOW CACHE SPACE
        010520  010636                          .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO LOW CACHE SPACE

   1877 010522  012701  000001          1$:     MOV     #1,R1           ;R1 CONTAINS IST FLOATING 1 PATTERN: 000001
   1878 010526  010137  177752                  MOV     R1,CHR          ;LOAD AMR<15:0> FROM CHR<15:0>
   1879 010532  105037  177751                  CLRB    CMR+1           ;LOAD AMR<21:16> FROM CMR<15:10>
   1880 010536  105037  177750                  CLRB    CMR             ;PRECONDITION AM BIT TO 0
   1881 010542  022701  000001                  CMP     #1,R1           ;IF PATTERN IS 000001 USE TSTB
   1882 010546  001002                          BNE     2$
   1883 010550  105711                          TSTB    (R1)
   1884 010552  000401                          BR      3$
   1885 010554  005711                  2$:     TST     (R1)            ;READ ADDRESS SPECIFIED IN R1
   1886                                                                 ;WHICH WILL PLACE FLOATING 1 PATTERN ON ADDRESS LINES
   1887                                                                 ;PA WILL BE SELECTED TO FEED CA LINES.
   1888 010556                          3$:
   1889 010556  000240                  25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
        010560  000240                          NOP                     ;FOR  LOOP ON ERROR
   1890 010562  032737  000010  177750          BIT     #AM,CMR         ;CHECK FOR 1
   1891 010570  001015                          BNE     9$              ;PASS
   1892 010572  010137  047320                  MOV     R1,AMR210+2     ;PREPARE PATTERN USED FOR AMR<21:0>
   1893                                                                 ;FOR ERROR TYPE.
   1894 010576  005037  047316                  CLR     AMR210
   1895 010602  010137  047314                  MOV     R1,CA210+2      ;PREPARE PATTREN USED FOR CA<21:0>
   1896 010606  005037  047312                  CLR     CA210
   1897 010612  104406                          ERROR                   ;ERROR
                                                                        ;-----
        010614  010612                          .WORD   .-2
   1898                                                                 ;AMR TESTS
   1899                                                                 ;AM BIT SHOULD HAVE READ 1 INDICATING A
   1900                                                                 ;MATCH CONDITION.
   1901 010616  047312                          CA210                   ;PRINT FLOATING 1 PATTERN USED FOR
   1902                                                                 ;CACHE ADDRESS LINES CA<21:0>
   1903 010620  047316                          AMR210                  ;PRINT   PATTERN USED FOR AMR<21:0> DATA
   1904 010622  000000                          .WORD   0
   1905 010624  006301                  9$:     ASL     R1              ;NEXT FLOATING 1 PATTERN
   1906 010626  032701  100000                  BIT     #100000,R1      ;IS ADDRESS PATTERN 40000 DONE?
   1907 010632  001735                          BEQ     1$              ;NO; CONTINUE
   1908 010634  000240                  10$:    NOP                     ;END OF TEST
```

TEST # 70 - VERIFY NO STUCK PA LINES OR SHORTED TO EACH OTHER

```
        010636  005237  001472                 INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
1914                                    .SBTTL  TEST # 71 - AFTER EACH FLOATING 1 PAT. CHECK AM BIT READS 1
                                        ;;*****************************************************************
                                        ;*TEST 71 - AFTER EACH FLOATING 1 PAT. CHECK AM BIT READS 1
                                        ;*      PA<21:15> FLOATING 1 PATTERN
                                        ;*      CA<21:15> FLOATING 1 PATTERN
                                        ;*      AMR<21:15> FLOATING 1 PATTERN
                                        ;;*****************************************************************
     010642                             TST71:
1915 010642  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     010644  010654                             .WORD   40$             ;TEST START LOCATION
     010646  060022                             .WORD   1$-40$+57764    ;LOOP ON ERROR START LOCATION
     010650  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     010652  060116                             .WORD   25$-40$+57764   ;LOOP ON ERROR END LOCATION
     010654  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     010662  004437  002342                     JSR     R4,RELCTL       ;LOCATE TEST CODE TO LOW CACHE SPACE
     010666  011166                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO LOW CACHE SPACE

1916 010670  012737  000002  002064  2$:       MOV     #2,CMRPAT       ;IST PATTERN FOR CMR<15:10>
1917 010676  012737  100000  002066             MOV     #100000,CHRPAT  ;IST PATTERN FOR CHR<15:0>
1918 010704  012737  001000  172350             MOV     #1000,KPAR4     ;SETUP IST PATTRN. FOR PAGE ADDRESS FIELD
1919                                                                    ;KPAR4 CONTAINS THE FLOATING 1
1920                                                                    ;PATTERN AND REPRESENTS THE PAGE ADDRESS FIELD
1921                                                                    ;DATA USED BY MEM. MNGMNT. TO
1922                                                                    ;CONSTRUCT THE PHYSICAL ADDRESS.
1923                                                                    ;1000 IS THE 1ST FLOATING  1 PATTERN
1924                                                                    ;WHICH WILL BE CONSTRUCTED AS PHYS. ADDRESS 100000.
1925 010712  012737  060104  000004  1$:       MOV     #6$-2$+60000,4  ;ALLOW FOR NEX TRAP
1926 010720  012737  000340  000006             MOV     #340,6
1927 010726  113737  002064  177751             MOVB    CMRPAT,CMR+1    ;LOAD AMR<21:16> FROM CMR<15:10>
1928 010734  013737  002066  177752             MOV     CHRPAT,CHR      ;LOAD AMR<15:0> FROM CHR<15:0>
1929 010742  012737  000001  177572             MOV     #1,SR0          ;ENABLE MEM. MNGMNT.
1930 010750  012737  000020  172516             MOV     #20,SR3         ;ENABLE 22-BIT MAPPING
1931 010756  105037  177750                     CLRB    CMR             ;PRECONDITION AM BIT TO 0
1932 010762  005737  100000                     TST     100000          ;WILL CHOOSE KPAR4 FOR ADDRESSING.
1933                                                                    ;PHYSICAL ADDRESS WILL BE DETERMINED
1934                                                                    ;BY FLOATING PATTERN USED.
1935 010766  000240                             NOP
1936 010770  000240                             NOP
1937 010772  000401                             BR      7$              ;NO TRAP
1938 010774  022626                     6$:     CMP     (SP)+,(SP)+     ;ADJUST STACK
1939 010776  005037  177572             7$:     CLR     SR0             ;DISABLE MEM. MNGMNT.
1940 011002  005037  172516                     CLR     SR3
1941 011006  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     011010  000240                             NOP                     ;FOR  LOOP ON ERROR
1942 011012  032737  000010  177750             BIT     #AM,CMR         ;CHECK FOR 1
1943 011020  001044                             BNE     9$              ;PASS
1944 011022  012737  000006  000004             MOV     #6,4
1945 011030  005037  000006                     CLR     6
1946 011034  005037  047320                     CLR     AMR210+2        ;PREPARE PATTERN USED FOR AMR<21:0>
1947                                                                    ;AND CA<21:0> FOR TYPEOUT
1948 011040  005037  047314                     CLR     CA210+2
1949 011044  013737  172350  047316             MOV     KPAR4,AMR210
1950 011052  013737  172350  047312             MOV     KPAR4,CA210
```

```
1951 011060  012737  000011  002062          MOV     #9.,LOOP
1952 011066  006237  047316          5$:     ASR     AMR210
1953 011072  006237  047312                  ASR     CA210
1954 011076  042737  100000  047316          BIC     #100000,AMR210
1955 011104  042737  100000  047312          BIC     #100000,CA210
1956 011112  005337  002062                  DEC     LOOP
1957 011116  001363                          BNE     5$
1958 011120  104406                          ERROR                   ;ERROR
                                                                     ;-----
     011122  011120                          .WORD   .-2
1959                                                                 ;AMR TESTS
1960 011124  047312                          CA210                   ;PRINT FLOAT. ADDRESS PATTERN USED
1961                                                                 ;FOR CA<21:0>
1962 011126  047316                          AMR210                  ;PRINT PATTERN USED FOR AMR<21:0>
1963 011130  000000                          .WORD   0
1964 011132  006337  172350          9$:     ASL     KPAR4           ;NEXT FLOATING 1 PATTERN
1965 011136  103405                          BCS     8$              ;IF PHYSICAL ADDRESS 10000000 DONE; FINISHED
1966 011140  006337  002064                  ASL     CMRPAT          ;NEXT CMR PATTERN
1967 011144  006337  002066                  ASL     CHRPAT          ;NEXT CHR PATTERN
1968 011150  000660                          BR      1$              ;CONTINUE
1969 011152  012737  000006  000004  8$:     MOV     #6,4            ;RESTORE VECTORS
1970 011160  005037  000006                  CLR     6
1971 011164  000240                  10$:    NOP                     ;END OF TEST
     011166  005237  001472                  INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 72 - LOADING TAG STORE FROM ADDRESS MATCH REGISTERS
                                ;;*********************************************************************
                                ;*TEST 72 - LOADING TAG STORE FROM ADDRESS MATCH REGISTERS
                                ;*      ALL 0'S TO TAG STORE ADDRESS LOCATION 0000.
                                ;;*********************************************************************
011172                          TST72:
1975 011172  000004                     SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                ;ERROR/LOOP ON TEST
     011174  011204                     .WORD   40$             ;TEST START LOCATION
     011176  070000                     .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     011200  000000                     .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     011202  070042                     .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     011204  012737  001015  177746 40$: MOV     #OFF,CCR        ;DISABLE CACHE
     011212  004437  002370             JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     011216  011354                     .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO HI CACHE SPACE

1977 011220  005037  177752     1$:     CLR     CHR             ;LOAD AMR<8:0> BY WRITING ALL 0'S TO CHR<8:0>
1978 011224  112737  000003  177750     MOVB    #HODO+TDAR,CMR  ;ALLOWS CACHE TAG FIELD BITS TO BE
1979                                                            ;WRITTEN TO CHR<15:07> ONLY DURING
1980                                                            ;THE DESTINATION MEMORY ACCESS
1981                                                            ;OF AN INSTRUCTION
1982                                                            ;ENABLE CACHE TAG FIELD TO BE WRITTEN
1983                                                            ;INTO FROM AMR<8:0>
1984 011232  012737  000015  177746         MOV     #15,CCR     ;NO UCB SO AS TO WRITE ENABLE TAG STORE
1985 011240  005737  040000                 TST     40000
1986 011244  005737  060000                 TST     60000       ;WRITE INTO TAG STORE
1987 011250  005737  060000                 TST     60000       ;WRITE TAG FIELD DATA FROM CACHE ADDRESS
1988                                                            ;LOCATION 0000 INTO CHR.
1989 011254  013737  177752  047322         MOV     CHR,CHR157  ;SAVE CHR DATA
1990 011262  000240             25$:        NOP                 ;INSTRUCTION 'JMP 1$' PLACED HERE
     011264  000240                         NOP                 ;FOR  LOOP ON ERROR
1991 011266  105037  177750                 CLRB    CMR         ;DISABLE MAINTENANCE MODE
1992 011272  012737  001015  177746         MOV     #OFF,CCR
1993 011300  042737  000177  047322         BIC     #177,CHR157 ;PREPARE CHR157 FOR ERROR CHECK
1994 011306  005737  047322                 TST     CHR157      ;BITS <15:07> SHOULD BE ALL 0'S
1995 011312  001417                         BEQ     10$         ;PASS
1996 011314  012737  000007  002062         MOV     #7,LOOP     ;ERROR;PREPARE CHR157 FOR TYPEOUT
1997 011322  006237  047322     2$:         ASR     CHR157
1998 011326  042737  100000  047322         BIC     #100000,CHR157
1999 011334  005337  002062                 DEC     LOOP
2000 011340  001370                         BNE     2$
2001 011342  104406                         ERROR               ;ERROR
                                                                ;-----
     011344  011342                         .WORD   .-2
2002                                                            ;TAG STORE DATA TESTS
2003                                                            ;READING TAGD<21:13> THRU CHR<15:07>
2004                                                            ;DID NOT RESULT IN ALL 0'S.
2005 011346  047322             CHR157                         ;PRINT CHR<15:07>
2006 011350  000000                         .WORD   0
2007 011352  000240             10$:        NOP                 ;END OF TEST
     011354  005237  001472                 INC     $TESTN      ;INCREMENT TEST COUNTER
```

```
                                        .SBTTL  TEST # 73 - ALL 1'S TO TAG STORE ADDRESS LOCATION 0000
                                        ;;*********************************************************************
                                        ;*TEST 73 - ALL 1'S TO TAG STORE ADDRESS LOCATION 0000
                                        ;*      ALL 1'S TO TAG STORE ADDRESS LOCATION 0000
                                        ;;*********************************************************************
     011360                             TST73:
2012 011360  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     011362  011372                             .WORD   40$             ;TEST START LOCATION
     011364  070000                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     011366  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     011370  070044                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     011372  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     011400  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     011404  011546                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

2013 011406  012737  177777  177752  1$:       MOV     #-1,CHR         ;LOAD AMR<8:0> BY WRITING ALL 1'S TO CHR<8:0>
2014 011414  112737  000003  177750            MOVB    #HODO+TDAR,CMR  ;ALLOWS CACHE TAG FIELD BITS TO BE
2015                                                                    ;WRITTEN TO CHR<15:07> ONLY DURING
2016                                                                    ;THE DESTINATION MEMORY ACCESS
2017                                                                    ;OF AN INSTRUCTION
2018                                                                    ;ENABLE CACHE TAG FIELD TO BE WRITTEN
2019                                                                    ;INTO FROM AMR<8:0>
2020 011422  012737  000015  177746            MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE
2021 011430  005737  040000                     TST     40000
2022 011434  005737  060000                     TST     60000           ;WRITE INTO TAG STORE
2023 011440  005737  060000                     TST     60000           ;WRITE TAG FIELD DATA FROM CACHE ADDRESS
2024                                                                    ;LOCATION 0000 INTO CHR.
2025 011444  013737  177752  047322            MOV     CHR,CHR157      ;SAVE CHR DATA
2026 011452  000240                  25$:       NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     011454  000240                             NOP                     ;FOR  LOOP ON ERROR
2027 011456  105037  177750                     CLRB    CMR             ;DISABLE MAINTENANCE MODE
2028 011462  012737  001015  177746            MOV     #OFF,CCR
2029 011470  042737  000177  047322            BIC     #177,CHR157
2030 011476  022737  177600  047322            CMP     #177600,CHR157  ;BITS <15:07> SHOULD BE ALL 1'S
2031 011504  001417                            BEQ     10$             ;PASS
2032 011506  012737  000007  002062            MOV     #7,LOOP         ;ERROR;PREPARE CHR157 FOR TYPEOUT
2033 011514  006237  047322            2$:     ASR     CHR157
2034 011520  042737  100000  047322            BIC     #100000,CHR157
2035 011526  005337  002062                     DEC     LOOP
2036 011532  001370                            BNE     2$
2037 011534  104406                            ERROR                   ;ERROR
                                                                        ;-----
     011536  011534                             .WORD   .-2
2038                                                                    ;TAG STORE DATA TESTS
2039                                                                    ;READING TAGD<21:13> THRU CHR<15:07>
2040                                                                    ;DID NOT RESULT IN ALL 1'S.
2041 011540  047322                     CHR157                         ;PRINT CHR<15:07>
2042 011542  000000                             .WORD   0
2043 011544  000240                  10$:       NOP                     ;END OF TEST
     011546  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
2047                                    .SBTTL  TEST # 74 - FLOAT 1 ACROSS 0'S TO TAG STORE ADRS LOC 0
                                        ;;*****************************************************************
                                        ;*TEST 74 - FLOAT 1 ACROSS 0'S TO TAG STORE ADRS LOC 0
                                        ;*      FLOAT 1 ACROSS 0'S TO TAG STORE ADDRESS LOCATION 0000
                                        ;;*****************************************************************
     011552                             TST74:
2048 011552  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     011554  011564                             .WORD   40$             ;TEST START LOCATION
     011556  070006                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     011560  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     011562  070052                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     011564  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     011572  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     011576  011756                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

2049 011600  012737  000001  047326             MOV     #1,CHR80        ;1ST FLOATING 1 PATTERN:001
2050 011606  012737  000015  177746  1$:        MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE CACHE STORE
2051 011614  013737  047326  177752             MOV     CHR80,CHR       ;LOAD AMR<8:0> VIA CHR<8:0> WITH
2052                                                                    ;FLOATING 1 PATTERN
2053 011622  112737  000003  177750             MOVB    #HODO+TDAR,CMR  ;ALLOWS CACHE TAG FIELD BITS TO BE
2054                                                                    ;WRITTEN TO CHR<15:07> ONLY DURING
2055                                                                    ;THE DESTINATION MEMORY ACCESS
2056                                                                    ;OF AN INSTRUCTION
2057                                                                    ;ENABLE CACHE TAG FIELD TO BE WRITTEN
2058                                                                    ;INTO FROM AMR<8:0>
2059 011630  005737  040000                     TST     40000
2060 011634  005737  060000                     TST     60000           ;WRITE INTO TAG STORE
2061 011640  005737  060000                     TST     60000           ;WRITE TAG FIELD DATA FROM CACHE ADDRESS
2062                                                                    ;LOCATION 0000 INTO CHR.
2063 011644  013737  177752  047322             MOV     CHR,CHR157      ;SAVE CHR DATA
2064 011652  000240                 25$:        NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     011654  000240                             NOP                     ;FOR  LOOP ON ERROR
2065 011656  105037  177750                     CLRB    CMR             ;DISABLE MAINTENANCE MODE
2066 011662  012737  001015  177746             MOV     #OFF,CCR        ;DISABLE CACHE
2067 011670  012737  000007  002062             MOV     #7,LOOP         ;PREPARE CHR157 FOR COMPARISON
2068 011676  006237  047322         3$:         ASR     CHR157
2069 011702  042737  100000  047322             BIC     #100000,CHR157
2070 011710  005337  002062                     DEC     LOOP
2071 011714  001370                             BNE     3$
2072 011716  023737  047326  047322             CMP     CHR80,CHR157    ;CHECK FOR CORRECT PATTERN
2073 011724  001405                             BEQ     9$              ;PASS
2074 011726  104406                             ERROR                   ;ERROR
                                                                        ;-----
     011730  011726                             .WORD   .-2
2075                                                                    ;TAG STORE DATA TESTS
2076                                                                    ;READING CHR<15:07> FOR TAGD<21:13>
2077                                                                    ;DID NOT RESULT IN CORRECT FLOATING
2078                                                                    ;1 PATTERN.
2079 011732  047322                             CHR157                  ;PRINT CHR<15:07>
2080 011734  047326                             CHR80                   ;PRINT FLOATING 1 PATTERN LOADED
2081                                                                    ;INTO CHR<8:0>
2082 011736  000000                             .WORD   0
2083 011740  006337  047326             9$:     ASL     CHR80           ;NEXT PATTERN
```

```
 2084 011744  032737  001000  047326          BIT     #1000,CHR80     ;IF PATTERN 400 DONE;FINISHED
 2085 011752  001715                          BEQ     1$              ;IF NOT, NEXT PASS
 2086 011754  000240                  10$:    NOP                     ;END OF TEST
      011756  005237  001472                  INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                        .SBTTL  TEST # 75 - CHECK ALL LOW CACHE TAG STORE ADRS LOCS
                                        ;;*********************************************************************
                                        ;*TEST 75 - CHECK ALL LOW CACHE TAG STORE ADRS LOCS
                                        ;*      WRITE AND READ 0'S TO ALL LOW CACHE TAG STORE ADDRESS LOCATIONS
                                        ;;*********************************************************************
     011762                             TST75:
2091 011762  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     011764  011774                             .WORD   40$             ;TEST START LOCATION
     011766  070014                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     011770  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     011772  070044                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     011774  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     012002  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     012006  012176                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

2092 012010  005037  177752                     CLR     CHR             ;LOAD AMR<8:0> BY WRITING ALL 0'S TO CHR<8:0>
2093 012014  012705  060000                     MOV     #60000,R5       ;ADDRESS 60000 INTO R5
2094 012020  012703  040000                     MOV     #40000,R3       ;ADDRESS 40000 INTO R3
2095 012024  012737  000015  177746  1$:        MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE CACHE STORE
2096 012032  112737  000003  177750             MOVB    #HODO+TDAR,CMR  ;ALLOWS CACHE TAG FIELD BITS TO BE
2097                                                                    ;WRITTEN TO CHR<15:07> ONLY DURING
2098                                                                    ;THE DESTINATION MEMORY ACCESS
2099                                                                    ;OF AN INSTRUCTION
2100                                                                    ;ENABLE CACHE TAG FIELD TO BE WRITTEN
2101                                                                    ;INTO FROM AMR<8:0>
2102 012040  005713                             TST     (R3)            ;
2103 012042  005715                             TST     (R5)            ;WRITE INTO TAG STORE
2104 012044  005715                             TST     (R5)            ;WRITE TAG STORE DATA INTO CHR FROM CACHE ADDRESS
2105                                                                    ;LOCATION SPECIFIED BY CA<12:1> IN R5.
2106 012046  013737  177752  047322             MOV     CHR,CHR157      ;SAVE CHR DATA
2107 012054  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     012056  000240                             NOP                     ;FOR  LOOP ON ERROR
2108 012060  105037  177750                     CLRB    CMR             ;DISABLE MAINTENANCE MODE
2109 012064  012737  001015  177746             MOV     #OFF,CCR        ;DISABLE CACHE
2110 012072  042737  000177  047322             BIC     #177,CHR157     ;PREPARE CHR157 FOR ERROR CHECK
2111 012100  005737  047322                     TST     CHR157          ;BITS <15:07> SHOULD BE ALL 0'S
2112 012104  001424                             BEQ     9$              ;PASS
2113 012106  010537  047314                     MOV     R5,CA210+2      ;SAVE CACHE ADDRESS USED: CA<21:0>
2114 012112  005037  047312                     CLR     CA210
2115 012116  012737  000007  002062             MOV     #7,LOOP         ;ERROR:PREPARE CHR157 FOR TYPEOUT
2116 012124  006237  047322             4$:     ASR     CHR157
2117 012130  042737  100000  047322             BIC     #100000,CHR157
2118 012136  005337  002062                     DEC     LOOP
2119 012142  001370                             BNE     4$
2120 012144  104406                             ERROR                   ;ERROR
                                                                        ;-----
     012146  012144                             .WORD   .-2
2121                                                                    ;TAG STORE DATA TESTS
2122                                                                    ;READING TAGD<21:13> THRU CHR<15:07>
2123                                                                    ;DID NOT RESULT IN ALL 0'S.
2124 012150  047322                     CHR157                         ;PRINT CHR<15:07>
2125 012152  047312                     CA210                          ;PRINT CA<21:0> ADDRESS USED
2126                                                                    ;BITS <12:1> IS THE CACHE TAG STORE ADDRESS
```

TEST # 75 - CHECK ALL LOW CACHE TAG STORE ADRS LOCS

```
                                                                    ;LOCATION FAILURE
2127
2128 012154  000000                        .WORD   0
2129 012156  062705  000002          9$:   ADD     #2,R5            ;NEXT CACHE STORE LOCATION
2130 012162  062703  000002                ADD     #2,R3
2131 012166  020527  070000                CMP     R5,#70000        ;HAVE ALL LOW CACHE ADDRESS LOCATIONS BEEN CHECKED?
2132 012172  001314                        BNE     1$               ;NO
2133 012174  000240                  10$:  NOP                      ;END OF TEST
     012176  005237  001472                INC     $TESTN           ;INCREMENT TEST COUNTER
```

```
                                        .SBTTL  TEST # 76 - TEST ALL LOW CACHE TAG STORE LOCATIONS
                                        ;;*****************************************************************
                                        ;*TEST 76 - TEST ALL LOW CACHE TAG STORE LOCATIONS
                                        ;*      WRITE AND READ 1'S TO ALL LOW CACHE TAG STORE ADDRESS LOCATIONS
                                        ;*      (0000 TO 37777)
                                        ;;*****************************************************************
     012202
2139 012202  000004                     TST76:  SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     012204  012214                             .WORD   40$             ;TEST START LOCATION
     012206  070016                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     012210  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     012212  070046                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     012214  012737  001015  177746     40$:    MOV     #OFF,CCR        ;DISABLE CACHE
     012222  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     012226  012422                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

2140 012230  012737  177777  177752             MOV     #-1,CHR         ;LOAD AMR<8:0> BY WRITING ALL 1'S TO CHR<8:0>
2141 012236  012705  060000                     MOV     #60000,R5       ;ADDRESS 60000 INTO R5
2142 012242  012703  040000                     MOV     #40000,R3       ;ADDRESS 40000 INTO R3
2143 012246  012737  000015  177746     1$:     MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE CACHE STORE
2144 012254  112737  000003  177750             MOVB    #HODO+TDAR,CMR  ;ALLOWS CACHE TAG FIELD BITS TO BE
2145                                                                    ;WRITTEN TO CHR<15:07> ONLY DURING
2146                                                                    ;THE DESTINATION MEMORY ACCESS
2147                                                                    ;OF AN INSTRUCTION
2148                                                                    ;ENABLE CACHE TAG FIELD TO BE WRITTEN
2149                                                                    ;INTO FROM AMR<8:0>
2150 012262  005713                             TST     (R3)            ;
2151 012264  005715                             TST     (R5)            ;WRITE INTO TAG STORE
2152 012266  005715                             TST     (R5)            ;WRITE TAG STORE DATA INTO CHR FROM CACHE ADDRESS
2153                                                                    ;LOCATION SPECIFIED BY CA<12:1> IN R5
2154 012270  013737  177752  047322             MOV     CHR,CHR157      ;SAVE CHR DATA
2155 012276  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     012300  000240                             NOP                     ;FOR  LOOP ON ERROR
2156 012302  105037  177750                     CLRB    CMR             ;DISABLE MAINTENANCE
2157 012306  012737  001015  177746             MOV     #OFF,CCR
2158 012314  042737  000177  047322             BIC     #177,CHR157
2159 012322  022737  177600  047322             CMP     #177600,CHR157  ;BITS <15:07> SHOULD BE ALL 1'S
2160 012330  001424                             BEQ     9$              ;PASS
2161 012332  010537  047314                     MOV     R5,CA210+2      ;SAVE CACHE ADDRESS USED: CA<21:0>
2162 012336  005037  047312                     CLR     CA210
2163 012342  012737  000007  002062             MOV     #7,LOOP         ;ERROR;PREPARE CHR157 FOR TYPEOUT
2164 012350  006237  047322             4$:     ASR     CHR157
2165 012354  042737  100000  047322             BIC     #100000,CHR157
2166 012362  005337  002062                     DEC     LOOP
2167 012366  001370                             BNE     4$
2168 012370  104406                             ERROR                   ;ERROR
                                                                        ;-----
     012372  012370                             .WORD   .-2
2169                                                                    ;TAG STORE DATA TESTS
2170                                                                    ;READING TAGD<21:13> THRU CHR<15:07>
2171                                                                    ;DID NOT RESULT IN ALL 1'S.
2172 012374  047312                     CA210                          ;PRINT CACHE ADDRESS CA<21:0>
2173 012376  047322                     CHR157                         ;PRINT CHR<15:07>
```

TEST # 76 - TEST ALL LOW CACHE TAG STORE LOCATIONS

```
2174 012400  000000                        .WORD   0
2175 012402  062705  000002        9$:     ADD     #2,R5           ;NEXT CACH LOCATION
2176 012406  062703  000002                ADD     #2,R3
2177 012412  020527  070000                CMP     R5,#70000       ;HAVE ALL LOCATIONS BEEN DONE?
2178 012416  001313                        BNE     1$              ;NO
2179 012420  000240              10$:     NOP                     ;END OF TEST
     012422  005237  001472                INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
TEST # 77 - TEST CLEARING OF ALL HI CACHE TAG STORE LOCATIONS
   2184                                 .SBTTL  TEST # 77 - TEST CLEARING OF ALL HI CACHE TAG STORE LOCATIONS
                                        ;;*****************************************************************
                                        ;*TEST 77 - TEST CLEARING OF ALL HI CACHE TAG STORE LOCATIONS
                                        ;*      WRITE AND READ 0'S TO ALL HI CACHE TAG STORE ADDRESS LOCATIONS
                                        ;*      (4000 TO 7777)
                                        ;;*****************************************************************
        012426                          TST77:
   2185 012426  000004                          SCPCND                          ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                                ;ERROR/LOOP ON TEST
        012430  012440                          .WORD   40$                     ;TEST START LOCATION
        012432  060014                          .WORD   1$-40$+57764            ;LOOP ON ERROR START LOCATION
        012434  000000                          .WORD   0                       ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
        012436  060044                          .WORD   25$-40$+57764           ;LOOP ON ERROR END LOCATION
        012440  012737  001015  177746  40$:    MOV     #OFF,CCR                ;DISABLE CACHE
        012446  004437  002342                  JSR     R4,RELCTL               ;LOCATE TEST CODE TO LOW CACHE SPACE
        012452  012642                          .WORD   10$+2                   ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO LOW CACHE SPACE

   2186 012454  005037  177752                  CLR     CHR                     ;LOAD AMR<8:0> BY WRITING ALL 0'S TO CHR<8:0>
   2187 012460  012705  070000                  MOV     #70000,R5               ;ADDRESS 70000 INTO R5
   2188 012464  012703  050000                  MOV     #50000,R3               ;ADDRESS 50000 INTO R3
   2189 012470  012737  000015  177746  1$:     MOV     #15,CCR                 ;NO UCB SO AS TO WRITE ENABLE CACHE STORE
   2190 012476  112737  000003  177750          MOVB    #HODO+TDAR,CMR          ;ALLOWS CACHE TAG FIELD BITS TO BE
   2191                                                                         ;WRITTEN TO CHR<15:07> ONLY DURING
   2192                                                                         ;THE DESTINATION MEMORY ACCESS
   2193                                                                         ;OF AN INSTRUCTION
   2194                                                                         ;ENABLE CACHE TAG FIELD TO BE WRITTEN
   2195                                                                         ;INTO FROM AMR<8:0>
   2196 012504  005713                          TST     (R3)                    ;
   2197 012506  005715                          TST     (R5)                    ;WRITE INTO TAG STORE
   2198 012510  005715                          TST     (R5)                    ;WRITE TAG STORE DATA INTO CHR FROM CACHE ADDRESS
   2199                                                                         ;LOCATION SPECIFIED BY CA<12:1> IN R5.
   2200 012512  013737  177752  047322          MOV     CHR,CHR157              ;SAVE CHR DATA
   2201 012520  000240                  25$:    NOP                             ;INSTRUCTION 'JMP 1$' PLACED HERE
        012522  000240                          NOP                             ;FOR  LOOP ON ERROR
   2202 012524  105037  177750                  CLRB    CMR                     ;DISABLE MAINTENANCE MODE
   2203 012530  012737  001015  177746          MOV     #OFF,CCR                ;DISABLE CACHE
   2204 012536  042737  000177  047322          BIC     #177,CHR157             ;PREPARE CHR157 FOR ERROR CHECK
   2205 012544  005737  047322                  TST     CHR157                  ;BITS <15:07> SHOULD BE ALL 0'S
   2206 012550  001424                          BEQ     9$                      ;PASS
   2207 012552  010537  047314                  MOV     R5,CA210+2              ;SAVE CACHE ADDRESS USED: CA<21:0>
   2208 012556  005037  047312                  CLR     CA210
   2209 012562  012737  000007  002062          MOV     #7,LOOP                 ;ERROR;PREPARE CHR157 FOR TYPEOUT
   2210 012570  006237  047322          4$:     ASR     CHR157
   2211 012574  042737  100000  047322          BIC     #100000,CHR157
   2212 012602  005337  002062                  DEC     LOOP
   2213 012606  001370                          BNE     4$
   2214 012610  104406                          ERROR                           ;ERROR
                                                                                ;-----
        012612  012610                          .WORD   .-2
   2215                                                                         ;TAG STORE DATA TESTS
   2216                                                                         ;READING TAGD<21:13> THRU CHR<15:07>
   2217                                                                         ;DID NOT RESULT IN ALL 0'S.
   2218 012614  047322                  CHR157  CHR157                          ;PRINT CHR<15:07>
   2219 012616  047312                  CA210   CA210                           ;PRINT CA<21:0> ADDRESS USED
```

TEST # 77 - TEST CLEARING OF ALL HI CACHE TAG STORE LOCATIONS

```
                                                                ;BITS <12:1> IS THE CACHE TAG STORE ADDRESS
                                                                ;LOCATION FAILURE
2222 012620  000000                    .WORD   0
2223 012622  062705  000002     9$:     ADD     #2,R5          ;NEXT CACHE STORE LOCATION
2224 012626  062703  000002             ADD     #2,R3
2225 012632  020527  100000             CMP     R5,#100000     ;HAVE ALL HI CACHE ADDRESS LOCATIONS BEEN CHECKED?
2226 012636  001314                     BNE     1$             ;NO
2227 012640  000240             10$:    NOP                    ;END OF TEST
     012642  005237  001472             INC     $TESTN         ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 100 - TEST CLEARING OF ALL HI CACHE TAG STORE LOCATIONS
                                ;;**********************************************************************
                                ;*TEST 100 - TEST CLEARING OF ALL HI CACHE TAG STORE LOCATIONS
                                ;*      WRITE AND READ 1'S TO ALL HI CACHE TAG STORE ADDRESS LOCATIONS
                                ;*      (4000 TO 7777)
                                ;;**********************************************************************
     012646                     TST100:
2233 012646  000004                     SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                ;ERROR/LOOP ON TEST
     012650  012660                     .WORD   40$             ;TEST START LOCATION
     012652  060016                     .WORD   1$-40$+57764    ;LOOP ON ERROR START LOCATION
     012654  000000                     .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     012656  060046                     .WORD   25$-40$+57764   ;LOOP ON ERROR END LOCATION
     012660  012737  001015  177746 40$: MOV     #OFF,CCR        ;DISABLE CACHE
     012666  004437  002342             JSR     R4,RELCTL       ;LOCATE TEST CODE TO LOW CACHE SPACE
     012672  013066                     .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO LOW CACHE SPACE

2234 012674  012737  177777  177752     MOV     #-1,CHR         ;LOAD AMR<8:0> BY WRITING ALL 1'S TO CHR<8:0>
2235 012702  012705  070000             MOV     #70000,R5       ;ADDRESS 70000 INTO R5
2236 012706  012703  050000             MOV     #50000,R3       ;ADDRESS 50000 INTO R3
2237 012712  012737  000015  177746 1$: MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE CACHE STORE
2238 012720  112737  000003  177750     MOVB    #HODO+TDAR,CMR  ;ALLOWS CACHE TAG FIELD BITS TO BE
2239                                                            ;WRITTEN TO CHR<15:07> ONLY DURING
2240                                                            ;THE DESTINATION MEMORY ACCESS
2241                                                            ;OF AN INSTRUCTION
2242                                                            ;ENABLE CACHE TAG FIELD TO BE WRITTEN
2243                                                            ;INTO FROM AMR<8:0>
2244 012726  005713                     TST     (R3)            ;
2245 012730  005715                     TST     (R5)            ;WRITE INTO TAG STORE
2246 012732  005715                     TST     (R5)            ;WRITE TAG STORE DATA INTO CHR FROM CACHE ADDRESS
2247                                                            ;LOCATION SPECIFIED BY CA<12:1> IN R5
2248 012734  013737  177752  047322     MOV     CHR,CHR157      ;SAVE CHR DATA
2249 012742  000240             25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     012744  000240                     NOP                     ;FOR  LOOP ON ERROR
2250 012746  105037  177750             CLRB    CMR             ;DISABLE MAINTENANCE
2251 012752  012737  001015  177746     MOV     #OFF,CCR
2252 012760  042737  000177  047322     BIC     #177,CHR157
2253 012766  022737  177600  047322     CMP     #177600,CHR157  ;BITS <15:07> SHOULD BE ALL 1'S
2254 012774  001424                     BEQ     9$              ;PASS
2255 012776  010537  047314             MOV     R5,CA210+2      ;SAVE CACHE ADDRESS USED: CA<21:0>
2256 013002  005037  047312             CLR     CA210
2257 013006  012737  000007  002062     MOV     #7,LOOP         ;ERROR;PREPARE CHR157 FOR TYPEOUT
2258 013014  006237  047322     4$:     ASR     CHR157
2259 013020  042737  100000  047322     BIC     #100000,CHR157
2260 013026  005337  002062             DEC     LOOP
2261 013032  001370                     BNE     4$
2262 013034  104406                     ERROR                   ;ERROR
                                                                ;-----
     013036  013034                     .WORD   .-2
2263                                                            ;TAG STORE DATA TESTS
2264                                                            ;READING TAGD<21:13> THRU CHR<15:07>
2265                                                            ;DID NOT RESULT IN ALL 1'S.
2266 013040  047312             CA210                          ;PRINT CACHE ADDRESS CA<21:0>
2267 013042  047322             CHR157                         ;PRINT CHR<15:07>
```

TEST # 100 - TEST CLEARING OF ALL HI CACHE TAG STORE LOCATIONS

```
2268 013044  000000                        .WORD   0
2269 013046  062705  000002        9$:     ADD     #2,R5           ;NEXT CACH LOCATION
2270 013052  062703  000002                ADD     #2,R3
2271 013056  020527  100000                CMP     R5,#100000      ;HAVE ALL LOCATIONS BEEN DONE?
2272 013062  001313                        BNE     1$              ;NO
2273 013064  000240        10$:    NOP                             ;END OF TEST
     013066  005237  001472                INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 101 - LOADING TAG STORE FROM CACHE ADRS LINES CA(21:13)
                                ;;*****************************************************************
                                ;*TEST 101 - LOADING TAG STORE FROM CACHE ADRS LINES CA(21:13)
                                ;*      CHECK LOADING OF TAG STORE DATA(TAG WRTD<21:13>) FROM
                                ;*      CACHE ADDRESS LINES CA<21:13>.
                                ;*      WRITE ALL 0'S IN TAG STORE LOCATION 0000 FROM CA<21:13>
                                ;;*****************************************************************
     013072                     TST101:
2280 013072  000004                     SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                ;ERROR/LOOP ON TEST
     013074  013104                     .WORD   40$             ;TEST START LOCATION
     013076  070000                     .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     013100  000000                     .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     013102  070036                     .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     013104  012737  001015  177746 40$: MOV     #OFF,CCR        ;DISABLE CACHE
     013112  004437  002370             JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     013116  013250                     .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO HI CACHE SPACE

2281 013120  112737  000002  177750 1$:  MOVB    #HODO,CMR       ;ALLOWS CACHE TAG FIELD BITS TO BE
2282                                                            ;WRITTEN TO CHR<15:07> ONLY DURING
2283                                                            ;THE DESTINATION MEMORY ACCESS
2284                                                            ;OF AN INSTRUCTION
2285 013126  012737  000015  177746      MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE CACHE STORE
2286 013134  005737  040000             TST     40000
2287 013140  005737  000000             TST     0               ;WRITE ALL 0'S INTO TAG STORE LOCATION 0000
2288                                                            ;FROM CACHE ADDRESS CA<21:13>
2289 013144  005737  000000             TST     0               ;WRITE TAG STORE DATA FROM  LOCATION
2290                                                            ;0000 INTO CHR<15:07>.
2291 013150  013737  177752  047322     MOV     CHR,CHR157      ;SAVE CHR DATA
2292 013156  000240             25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     013160  000240                     NOP                     ;FOR  LOOP ON ERROR
2293 013162  105037  177750             CLRB    CMR             ;DISABLE MAINTENANCE MODE
2294 013166  012737  001015  177746     MOV     #OFF,CCR        ;DISABLE CACHE
2295 013174  042737  000177  047322     BIC     #177,CHR157     ;PREPARE CHR157 FOR ERROR CHECK
2296 013202  005737  047322             TST     CHR157          ;BITS <15:07> SHOULD BE ALL 0'S
2297 013206  001417                     BEQ     10$             ;PASS
2298 013210  012737  000007  002062     MOV     #7,LOOP         ;ERROR;PREPARE CHR157 FOR TYPEOUT
2299 013216  006237  047322     2$:     ASR     CHR157
2300 013222  042737  100000  047322     BIC     #100000,CHR157
2301 013230  005337  002062             DEC     LOOP
2302 013234  001370                     BNE     2$
2303 013236  104406                     ERROR                   ;ERROR
                                                                ;-----
     013240  013236                     .WORD   .-2
2304                                                            ;TAG STORE DATA TESTS
2305                                                            ;READING TAGD<21:13> THRU CHR<15:07>
2306                                                            ;DID NOT RESULT IN ALL 0'S.
2307 013242  047322             CHR157                         ;PRINT CHR<15:07>
2308 013244  000000             .WORD   0
2309 013246  000240             10$:    NOP                     ;END OF TEST
     013250  005237  001472             INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
2317                                    .SBTTL  TEST # 102 - WRITE FLOATING 1 ACROSS 0'S INTO TAG LOC 0
                                        ;;*****************************************************************
                                        ;*TEST 102 - WRITE FLOATING 1 ACROSS 0'S INTO TAG LOC 0
                                        ;*      WRITE FLOATING 1 ACROSS 0'S INTO TAG STORE LOCATION 0000
                                        ;*      FROM CA<21:13> USING AVAILABLE MEMORY.
                                        ;*      PROCEDURE:  STARTING AT 8K BOUNDARY(ADDR. 20000) CHECK
                                        ;*      FOR AVAILABLE FLOATING ADDRESS UP TO ADDR. 10000000
                                        ;*      WHEN THE FLOATING ADDRESS EXISTS PERFORM THE TEST.
                                        ;;*****************************************************************
     013254                             TST102:
2318 013254  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     013256  013266                             .WORD   40$             ;TEST START LOCATION
     013260  070006                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     013262  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     013264  070100                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     013266  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     013274  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     013300  013566                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

2319 013302  012737  000200  172350  2$:       MOV     #200,KPAR4      ;KPAR4 CONTAINS THE FLOATING 1 PATTERN
2320                                                                    ;AND REPRESENTS THE THE PAGE ADDRESS FIELD
2321                                                                    ;DATA USED BY MEMORY MNGMNT. TO CONSTRUCT
2322                                                                    ;THE PHYSICAL ADDRESS.  200 IS THE 1ST
2323                                                                    ;FLOATING 1 PATTERN WHICH WILL BE CONSTRUCTED
2324                                                                    ;TO ADDRESS 20000.
2325 013310  012737  070240  000004  1$:        MOV     #7$-2$+70000,4  ;ALLOW FOR NEX TRAP
2326 013316  012737  000340  000006             MOV     #340,6
2327 013324  112737  000002  177750             MOVB    #HODO,CMR       ;ALLOWS CACHE TAG STORE TO BE WRITTEN
2328                                                                    ;TO CHR<15:07> ONLY DURING THE DESTINATION
2329                                                                    ;MEMORY ACCESS OF AN INSTRUCTION.
2330 013332  012737  000001  177572             MOV     #1,SR0          ;ENABLE MEMORY MNGMNT.
2331 013340  012737  000020  172516             MOV     #20,SR3         ;ENABLE 22-BIT MAPPING
2332 013346  012737  000015  177746             MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE CACHE STORE
2333 013354  005737  040000                     TST     40000           ;
2334 013360  005737  100000                     TST     100000          ;CHOOSES KPAR4 FOR ADDRESSING. PHYSICAL
2335                                                                    ;ADDRESS WILL BE DETERMINED BY FLOATING
2336                                                                    ;PATTERN USED IN KPAR4. TAG STORE WILL
2337                                                                    ;BE WRITTEN WITH DATA PLACED ON CA<21:13> ADDRESS LINES.
2338 013364  000240                             NOP
2339 013366  000240                             NOP                     ;NO TRAP
2340 013370  005737  100000                     TST     100000          ;WRITE TAG STOR E DATA FROM LOCATION
2341                                                                    ;0000 INTO CHR<15:07>.
2342 013374  013737  177752  047322             MOV     CHR,CHR157      ;SAVE CHR INFO.
2343 013402  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     013404  000240                             NOP                     ;FOR  LOOP ON ERROR
2344 013406  005037  177572                     CLR     SR0             ;DISABLE MEM MNGMENT.
2345 013412  005037  172516                     CLR     SR3
2346 013416  012737  001015  177746             MOV     #OFF,CCR        ;DISABLE CACHE
2347 013424  105037  177750                     CLRB    CMR             ;DISABLE MAINTENANCE
2348 013430  042737  000177  047322             BIC     #177,CHR157
2349 013436  023737  172350  047322             CMP     KPAR4,CHR157    ;IS THERE ERROR?
2350 013444  001437                             BEQ     9$              ;PASS
2351 013446  012737  000006  000004             MOV     #6,4
```

```
2352 013454  005037  000006                    CLR     6
2353 013460  013737  172350  047324            MOV     KPAR4,CA2113    ;SAVE PATTERN USED FOR CA<21:13>.
2354 013466  012737  000007  002062            MOV     #7,LOOP         ;PREPARE CHR157 AND CA2113 FOR ERROR PRINT
2355 013474  006237  047322          5$:       ASR     CHR157
2356 013500  006237  047324                    ASR     CA2113
2357 013504  042737  100000  047322            BIC     #100000,CHR157
2358 013512  042737  100000  047324            BIC     #100000,CA2113
2359 013520  005337  002062                    DEC     LOOP
2360 013524  001363                            BNE     5$
2361 013526  104406                            ERROR                   ;ERROR
                                                                        ;-----
     013530  013526                            .WORD   .-2
2362                                                                    ;TAG STORE TESTS
2363                                                                    ;READING CHR<15:07> FOR TAG DATA (TAGD <21:13>)
2364                                                                    ;DID NOT RESULT IN CORRECT ADDRESS PATTERN
2365                                                                    ;LOADED FROM CA<21:13>.
2366 013532  047322                            CHR157                  ;PRINT CHR<15:07>
2367 013534  047324                            CA2113                  ;PRINT ADDRESS PATTERN USED: CA<21:13>
2368 013536  000000                            .WORD   0               ;PRINT TERMINATE
2369 013540  000401                            BR      9$              ;NEXT PATTERN
2370 013542  022626                  7$:       CMP     (SP)+,(SP)+     ;RESTORE STACK DUE TO INTERRUPT
2371 013544  006337  172350          9$:       ASL     KPAR4           ;NEXT PATTERN;IF PHYSICAL ADDRESS
2372                                                                    ;10000000 HAS BEEN DONE; FINISHED
2373 013550  103257                            BCC     1$
2374 013552  012737  000006  000004            MOV     #6,4            ;RESTORE VECTORS
2375 013560  005037  000006                    CLR     6
2376 013564  000240                  10$:      NOP                     ;END OF TEST
     013566  005237  001472                    INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
 2387                                   .SBTTL  TEST # 103 - FLOAT 1 ACROSS 0'S INTO TAG STORE ADRS LOC 0
                                        ;;*****************************************************************
                                        ;*TEST 103 - FLOAT 1 ACROSS 0'S INTO TAG STORE ADRS LOC 0
                                        ;*      WRITE FLOATING 1 ACROSS 0'S INTO TAG STORE ADDRESS LOCATION 0000
                                        ;*      FROM CA<21:13> USING RMI REGISTER (G5179)
                                        ;*      PROCEDURE:  START AT 16K BOUNDARY (ADDR. 100000) AND CHECK FOR
                                        ;*      AVAILABLE FLOATING ADRESSES UP TO ADDR. 10000000
                                        ;*      WHEREEVER A FLOATING ADDRESS DOES NOT EXIST USE
                                        ;*      THE RMI REGISTER. IF ADDRESS EXISTS DO NOT PERFORM
                                        ;*      THE TEST SINCE THAT LOCATION WOULD HAVE BEEN TESTED
                                        ;*      BY THE PREVIOUS TEST.
                                        ;;*****************************************************************
     013572                             TST103:
 2388 013572  000004                            SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
      013574  013604                            .WORD   40$             ;TEST START LOCATION
      013576  070050                            .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
      013600  000000                            .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
      013602  070166                            .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
      013604  012737  001015  177746  40$:      MOV     #OFF,CCR        ;DISABLE CACHE
      013612  004437  002370                    JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
      013616  014344                            .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

 2389 013620  132737  000200  001507  2$:      BITB    #APTSIZE,$ENVM  ;DOES APT SIZE?
 2390 013626  001405                            BEQ     11$             ;NO ,GO AUTOSIZE
 2391 013630  032737  000200  001512            BIT     #200,$USWR      ;DOES  APT INDICATE
 2392                                                                   ;THAT RMI REGISTER IS PRESENT
 2393 013636  001006                            BNE     5$              ;YES,USE IT
 2394 013640  000555                            BR      4$              ;APT SAYS DO NOT PERFORM TEST
 2395 013642  012737  070352  000004  11$:      MOV     #3$-2$+70000,4  ;AUTO-SIZE FOR RMI,PREPARE FOR TRAP
 2396 013650  005737  177770                    TST     177770          ;READ RMI
 2397 013654  012737  001000  172350  5$:       MOV     #1000,KPAR4     ;SETUP MEM. MNG. PAGE 4 FOR FIRST FLO..TING
 2398                                                                   ;ADDRESS 100000
 2399 013662  012737  000002  047344            MOV     #2,FLTPAT       ;SETUP 1ST FLOATING PATTERN FOR RMI
 2400                                                                   ;REG. CORRESPONDING TO ADDRESS 40000
 2401 013670  012737  070100  000004  1$:       MOV     #8$-2$+70000,4  ;SETUP FOR NEX MEMORY
 2402 013676  012737  000001  177572            MOV     #1,SR0          ;ENABLE MEM.MNGMENT.
 2403 013704  012737  000020  172516            MOV     #20,SR3         ;ENABLE 22 BIT MAPPING
 2404 013712  005737  100000                    TST     100000          ;SELECT PAGE 4. READ ADDRESS SPECIFIED BY KPAR4.
 2405 013716  000512                            BR      9$              ;NO TRAP.MEMORY LOCATION EXISTS,SO DON'T
 2406                                                                   ;BOTHER TESTING WITH RMI FOR THIS LOCATION
 2407 013720  022626                    8$:     CMP     (SP)+,(SP)+     ;TRAP HERE WHEN FLOATING ADDRESS
 2408                                                                   ;LOCATION DOES NOT EXIST.USE RMI FOR TESTING
 2409 013722  013701  047344                    MOV     FLTPAT,R1       ;PREPARE FLTPAT FOR LOADING INTO RMI
 2410 013726  005101                            COM     R1
 2411 013730  110137  177770                    MOVB    R1,177770       ;LOAD RMI REGISTER
 2412 013734  112737  000002  177750            MOVB    #HODO,CMR       ;ALLOWS CACHE TAG STORE TO BE WRITTEN
 2413                                                                   ;TO CMR<15:07> DURING THE DESTINATION
 2414                                                                   ;MEMORY ACCESS OF AN INSTRUCTION ONLY
 2415 013742  012737  000015  177746            MOV     #15,CCR         ;NO UCB TO ENABLE TAG STORE WRITING
 2416 013750  052737  000400  177770            BIS     #400,177770     ;ENABLE RMI
 2417 013756  005737  040000                    TST     40000           ;
 2418 013762  005737  100000                    TST     100000          ;SELECT PAGE 4 AND READ FLOATING ADDRESS
 2419                                                                   ;SPECIFIED BY KPAR4. RMI WILL RESPOND
```

```
                                                                        ;RESULTING IN THE TAG STORE BEING LOADED
                                                                        ;FROM CA<21:13>
014766  005737  100000                    TST     100000                ;WRITE TAG STORE DATA TO CHR<15:07>
014772  013737  177752  047322            MOV     CHR,CHR157            ;SAVE CHR DATA
014000  042737  000400  177770            BIC     #400,177770           ;DISABLE RMI
014006  000240                    25$:    NOP                           ;INSTRUCTION 'JMP 1$' PLACED HERE
014010  000240                            NOP                           ;FOR  LOOP ON ERROR
014012  005037  177572                    CLR     SR0                   ;DISABLE MEM MNGMENT.
014016  005037  172516                    CLR     SR3
014022  012737  001015  177746            MOV     #OFF,CCR              ;DISABLE CACHE
014030  105037  177750                    CLRB    CMR                   ;DISABLE MAINTENANCE
014034  042737  000177  047322            BIC     #177,CHR157
014042  023737  172350  047322            CMP     KPAR4,CHR157          ;IS THERE ERROR?
014050  001435                            BEQ     9$                    ;PASS
014052  012737  000006  000004            MOV     #6,4
014060  005037  000006                    CLR     6
014064  013737  172350  047324            MOV     KPAR4,CA2113          ;SAVE PATTERN USED FOR CA<21:13>.
014072  012737  000007  002062            MOV     #7,LOOP               ;PREPARE CHR157 AND CA2113 FOR ERROR PRINT
014100  006237  047322            6$:     ASR     CHR157
014104  006237  047324                    ASR     CA2113
014110  042737  100000  047322            BIC     #100000,CHR157
014116  042737  100000  047324            BIC     #100000,CA2113
014124  005337  002062                    DEC     LOOP
014130  001363                            BNE     6$
014132  104406                            ERROR                         ;ERROR
                                                                        ;-----
014134  014132                            .WORD   .-2
                                                                        ;TAG STORE TESTS USING RMI REGISTER
                                                                        ;READING CHR<15:07> FOR TAG DATA (TAGD <21:13>)
                                                                        ;DID NOT RESULT IN CORRECT ADDRESS PATTERN
                                                                        ;LOADED FROM CA<21:13>.
014136  047322                    CHR157                                ;PRINT CHR<15:07>
014140  047324                    CA2113                                ;PRINT ADDRESS PATTERN USED: CA<21:13>
014142  000000                    .WORD   0                             ;PRINT TERMINATE
014144  006337  172350    9$:     ASL     KPAR4                         ;NEXT FLOATING ADDRESS
014150  006337  047344            ASL     FLTPAT                        ;NEXT ADDRESS FO RMI
014154  103245                    BCC     1$                            ;CONTINUE TEST. ADDRESS 10000000
                                                                        ;NOT DONE
014156  012737  000006  000004            MOV     #6,4                  ;RESTORE TRAP VECTORES
014164  005037  000006                    CLR     6
014170  000464                            BR      10$                   ;END THE TEST
014172  022626            3$:     CMP     (SP)+,(SP)+                   ;TRAP TO HERE IF NO RMI
014174  012737  000006  000004    4$:     MOV     #6,4                  ;RESTORE VECTORS
014202  005037  000006                    CLR     6
014206  005737  001474                    TST     $PASS                 ;1ST PASS?
014212  001053                            BNE     10$                   ;NO
014214  023737  000042  000046            CMP     42,46                 ;IS THIS ACT11 QV OR AUTO ACCEPT
014222  001447                            BEQ     10$                   ;YES,SKIP TYPEOUT
014224  104401  014232                    TYPE    ,65$                  ;;TYPE ASCIZ STRING
014230  000427                            BR      64$                   ;;GET OVER THE ASCIZ
014232     200     122     115    65$:     .ASCIZ  <CRLF>/RMI REGISTER (G5179) NOT USED-SKIP HI ORDER/
                                            .EVEN
014310                            64$:
014310  104401  014316                    TYPE    ,67$                  ;;TYPE ASCIZ STRING
014314  000412                            BR      66$                   ;;GET OVER THE ASCIZ
014316     040     102     111    67$:     .ASCIZ  / BIT ADDRESS TEST/<CRLF>
                                            .EVEN
```

```
        014342                          66$:
  2467  014342  000240                  10$:    NOP                     ;END OF TEST
        014344  005237  001472                  INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
TEST # 104 - VERIFY TAG STORE ADDRESS LINES (CA(12:1))
   2476                                 .SBTTL  TEST # 104 - VERIFY TAG STORE ADDRESS LINES (CA(12:1))
                                        ;;*****************************************************************
                                        ;*TEST 104 - VERIFY TAG STORE ADDRESS LINES (CA(12:1))
                                        ;*      VERIFY TAG STORE ADDRESS LINES (CA<12:1>)
                                        ;*PROCEDURE:  WRITE 0 INTO TAGG PARITY STORE ADDRESS LOCATION 0000.
                                        ;*      WRITE BIT PATTERN 000000011 INTO TAG PARITY STORE LOCATION 0001.
                                        ;*      READ TAG PARITY ADDRESS LOCATION 0000 FOR 0'S REPEAT THE ABOVE
                                        ;*      SEQUENCE,EACH TIME CHANGING THE ADDRESS LOCATION THE BIT PATTERN
                                        ;*      IS WRITTEN TO BY SHIFTING THE 1 ONE PLACE TO THE LEFT.
                                        ;;*****************************************************************
        014350
   2477 014350  000004                  TST104:
                                                SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
        014352  014362                          .WORD   40$             ;TEST START LOCATION
        014354  070032                          .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
        014356  000000                          .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
        014360  070072                          .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
        014362  012737  001015  177746  40$:    MOV     #OFF,CCR        ;DISABLE CACHE
        014370  004437  002370                  JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
        014374  014556                          .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

   2478 014376  012737  000002  047344          MOV     #2,FLTPAT       ;1ST FLOATING CACHE DATA STORE ADDRESS PATTERN
   2479 014404  012702  040000  2$:     MOV     #40000,R2       ;
   2480 014410  012703  060000          MOV     #60000,R3       ;
   2481 014414  063702  047344          ADD     FLTPAT,R2       ;R2 CONTAINS 40000+FLTPAT
   2482 014420  063703  047344          ADD     FLTPAT,R3       ;R3 CONTAINS 60000+FLTPAT
   2483 014424  012713  177777          MOV     #-1,(R3)        ;ALL 1'S TO MAIN MEM. LOCATION
   2484                                                         ;SPECIFIED BY R3
   2485 014430  112737  000002  177750  1$:     MOVB    #HODO,CMR       ;ALLOWS TAG  STORE BIT  TO BE
   2486                                                         ;WRITTEN TO CHR<15:07> ONLY DURING THE
   2487                                                         ;DESTINATION MEMORY ACCESS OF AN INSTRUCTION.
   2488 014436  012737  000015  177746          MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE CACHE STORE
   2489 014444  005737  040000                  TST     40000
   2490 014450  005737  000000                  TST     0               ;READ UPDATE; WRITE ALL 0'S INTO CACHE
   2491                                                         ;TAG STORE LOCATION 0000.
   2492 014454  005712                          TST     (R2)
   2493 014456  005713                          TST     (R3)            ;READ UPDATE;WRITE BIT PATTERN 000000011
   2494                                                         ;INTO TAG STORE LOCATION SPECIFIED
   2495                                                         ;BY R3'S BITS 1 THRU 12: CA<12:1>
   2496 014460  005737  060000                  TST     60000           ;LOAD TAG STORE LOCATION 0000 INTO CHR
   2497 014464  013701  177752                  MOV     CHR,R1          ;SAVE CHR CONTENTS
   2498 014470  000240          25$:    NOP                             ;INSTRUCTION 'JMP 1$' PLACED HERE
        014472  000240                  NOP                             ;FOR  LOOP ON ERROR
   2499 014474  105037  177750                  CLRB    CMR             ;DISABLE MAINT. MODE
   2500 014500  012737  001015  177746          MOV     #OFF,CCR        ;DISABLE CACHE
   2501 014506  042701  000177                  BIC     #177,R1         ;INTERESTED IN ONLY BITS 15:07
   2502 014512  005701                          TST     R1              ;CHECK FOR ALL 0'S
   2503 014514  001411                          BEQ     9$              ;PASS
   2504 014516  013737  047344  047334          MOV     FLTPAT,CA121    ;SAVE CA<12:1> USED
   2505 014524  006237  047334                  ASR     CA121           ;PREPARE CA121 FOR TYPEOUT
   2506 014530  104406                          ERROR                   ;ERROR
                                                                        ;-----
        014532  014530                  .WORD   .-2                     ;TAG STORE ADRESS LINE TESTS
   2507
```

```
2508                                                            ;READING CHR<15:07> FOR CACHE TAG STORE
2509                                                            ;DID NOT RESULT IN ALL 0'S
2510 014534  047334                        CA121                ;PRINT CACHE TAG STORE ADDRESS LOCATION
2511                                                            ;USED: CA<12:1>. NOTE THAT THE 1 IN
2512                                                            ;THIS PATTERN WILL POINT TO THE ADDRESS
2513                                                            ;LINE THAT POSSIBLY CAUSES ERROR.
2514 014536  000000                        .WORD   0
2515 014540  006337  047344          9$:   ASL     FLTPAT       ;NEXT PATTERN
2516 014544  022737  020000  047344        CMP     #20000,FLTPAT ;HAS CACHE TAG STORE LOCAT. 4000 BEEN DONE?
2517 014552  001314                        BNE     2$           ;NO
2518 014554  000240                 10$:   NOP                  ;END OF TEST
     014556  005237  001472                INC     $TESTN       ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 105 - WRITE ALL 0'S INTO  DATA STORE LOCATION 0000
                                ;;*****************************************************************
                                ;*TEST 105 - WRITE ALL 0'S INTO  DATA STORE LOCATION 0000
                                ;*      WRITE ALL 0'S INTO  DATA STORE LOCATION 0000.
                                ;*      READ ALL 0'S FROM CACHE DATA REGISTER.
                                ;;*****************************************************************
     014562                     TST105:
2524 014562  000004                     SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                ;ERROR/LOOP ON TEST
     014564  014574                     .WORD   40$             ;TEST START LOCATION
     014566  070004                     .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     014570  000000                     .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     014572  070042                     .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     014574  012737  001015  177746 40$: MOV     #OFF,CCR        ;DISABLE CACHE
     014602  004437  002370             JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     014606  014710                     .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO HI CACHE SPACE

2525 014610  005037  060000             CLR     60000           ;0'S TO MAIN MEMORY LOCATION
2526 014614  112737  000002  177750 1$: MOVB    #HODO,CMR       ;ALLOWS CACHE DATA STORE BITS TO BE
2527                                                            ;WRITTEN TO CDR<15:0> ONLY DURING THE
2528                                                            ;DESTINATION MEMORY ACCESS OF AN INSTRUCTION.
2529 014622  012737  000015  177746     MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE CACHE STORE
2530 014630  005737  040000             TST     40000           ;
2531 014634  005737  060000             TST     60000           ;WRITE ALL 0'S TO  DATA STORE
2532                                                            ;LOCATION 0000 FROM MAIN MEMORY
2533                                                            ;LOC. 60000
2534 014640  005737  060000             TST     60000           ;WRITE  DATA STORE BITS FROM
2535                                                            ;LOC. 0000 INTO CDR<15:0>.
2536 014644  013737  177754  047330     MOV     CDR,CDR150      ;SAVE CDR CONTENTS
2537 014652  000240             25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     014654  000240                     NOP                     ;FOR  LOOP ON ERROR
2538 014656  105037  177750             CLRB    CMR             ;DISABLE MAINTENANCE
2539 014662  012737  001015  177746     MOV     #OFF,CCR        ;DISABLE CACHE
2540 014670  005737  047330             TST     CDR150          ;CHECK FOR 0
2541 014674  001404                     BEQ     10$             ;PASS
2542 014676  104406                     ERROR                   ;ERROR
                                                                ;-----
     014700  014676                     .WORD   .-2
2543                                                            ; DATA STORE TESTS
2544                                                            ;READING CDR<15:0> DID NOT RESULT
2545                                                            ;IN ALL 0'S
2546 014702  047330             CDR150                          ;PRINT CDR<15:0> DATA READ.
2547 014704  000000                     .WORD   0
2548 014706  000240             10$:    NOP                     ;END OF TEST
     014710  005237  001472             INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                        .SBTTL  TEST # 106 - WRITE ALL 1'S INTO  DATA STORE LOCATION 0000
                                        ;;*****************************************************************
                                        ;*TEST 106 - WRITE ALL 1'S INTO  DATA STORE LOCATION 0000
                                        ;*      WRITE ALL 1'S INTO  DATA STORE LOCATION 0000.
                                        ;*      READ ALL 1'S FROM CACHE DATA REGISTER.
                                        ;;*****************************************************************
     014714                             TST106:
2554 014714  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     014716  014726                             .WORD   40$             ;TEST START LOCATION
     014720  070006                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     014722  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     014724  070044                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     014726  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     014734  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     014740  015046                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

2555 014742  012737  177777  060000           MOV     #-1,60000       ;1'S TO MAIN MEMORY LOCATION
2556 014750  112737  000002  177750  1$:      MOVB    #HODO,CMR       ;ALLOWS CACHE DATA STORE BITS TO BE
2557                                                                    ;WRITTEN TO CDR<15:07> ONLY DURING THE
2558                                                                    ;DESTINATION MEMORY ACCESS OF AN INSTRUCTION.
2559 014756  012737  000015  177746           MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE CACHE STORE
2560 014764  005737  040000                   TST     40000           ;
2561 014770  005737  060000                   TST     60000           ;WRITE ALL 1'S TO  DATA STORE
2562                                                                    ;LOCATION 0000 FROM MAIN MEMORY
2563                                                                    ;LOC. 60000
2564 014774  005737  060000                   TST     60000           ;WRITE  DATA STORE BITS FROM
2565                                                                    ;LOC. 0000 INTO CDR<15:07>.
2566 015000  013737  177754  047330           MOV     CDR,CDR150      ;SAVE CDR CONTENTS
2567 015006  000240                  25$:      NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     015010  000240                            NOP                     ;FOR  LOOP ON ERROR
2568 015012  105037  177750                   CLRB    CMR             ;DISABLE MAINTENANCE
2569 015016  012737  001015  177746           MOV     #OFF,CCR        ;DISABLE CACHE
2570 015024  022737  177777  047330           CMP     #-1,CDR150      ;CHECK ALL 1'S
2571 015032  001404                           BEQ     10$             ;PASS
2572 015034  104406                           ERROR                   ;ERROR
                                                                        ;-----
     015036  015034                           .WORD   .-2
2573                                                                    ; DATA STORE TESTS
2574                                                                    ;READING CDR<15:0> DID NOT RESULT
2575                                                                    ;IN ALL 1'S
2576 015040  047330                   CDR150                            ;PRINT CDR<15:0> DATA READ.
2577 015042  000000                           .WORD   0
2578 015044  000240                  10$:      NOP                     ;END OF TEST
     015046  005237  001472                   INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
2583                                    .SBTTL  TEST # 107 - WRITE FLOATING 1 PATRN INTO DATA STORE LOC 0
                                        ;;*****************************************************************
                                        ;*TEST 107 - WRITE FLOATING 1 PATRN INTO DATA STORE LOC 0
                                        ;*      WRITE FLOATING 1 PATTERN INTO  DATA STORE LOCATION 0000.
                                        ;*      READ FLOATING 1 PATTERN FROM CACHE DATA REGISTER.
                                        ;;*****************************************************************
     015052
2584 015052  000004                    TST107:
                                            SCPCND                      ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     015054  015064                         .WORD   40$                 ;TEST START LOCATION
     015056  070014                         .WORD   1$-40$+67764        ;LOOP ON ERROR START LOCATION
     015060  000000                         .WORD   0                   ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     015062  070052                         .WORD   25$-40$+67764       ;LOOP ON ERROR END LOCATION
     015064  012737  001015  177746 40$:    MOV     #OFF,CCR            ;DISABLE CACHE
     015072  004437  002370                 JSR     R4,RELCTH           ;LOCATE TEST CODE TO HIGH CACHE SPACE
     015076  015232                         .WORD   10$+2               ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

2585 015100  012737  000001  047344         MOV     #1,FLTPAT           ;1ST FLOATING 1 PATTERN: 000001
2586 015106  013737  047344  060000 2$:     MOV     FLTPAT,60000        ;FLOATING PATTERN TO MAIN MEMORY
2587 015114  112737  000002  177750 1$:     MOVB    #HODO,CMR           ;ALLOWS CACHE DATA STORE BITS TO BE
2588                                                                    ;WRITTEN TO CDR<15:07> ONLY DURING THE
2589                                                                    ;DESTINATION MEMORY ACCESS OF AN INSTRUCTION.
2590 015122  012737  000015  177746         MOV     #15,CCR             ;NO UCB SO AS TO WRITE ENABLE CACHE STORE
2591 015130  005737  040000                 TST     40000               ;
2592 015134  005737  060000                 TST     60000               ;WRITE FLOATING 1 PATTERN TO  DATA STORE
2593                                                                    ;LOCATION 0000 FROM MAIN MEMORY
2594                                                                    ;LOC. 60000
2595 015140  005737  060000                 TST     60000               ;WRITE  DATA STORE BITS FROM
2596                                                                    ;LOC. 0000 INTO CDR<15:0>.
2597 015144  013737  177754  047330         MOV     CDR,CDR150          ;SAVE CDR CONTENTS
2598 015152  000240             25$:        NOP                         ;INSTRUCTION 'JMP 1$' PLACED HERE
     015154  000240                         NOP                         ;FOR  LOOP ON ERROR
2599 015156  105037  177750                 CLRB    CMR                 ;DISABLE MAINTENANCE
2600 015162  012737  001015  177746         MOV     #OFF,CCR            ;DISABLE CACHE
2601 015170  023737  047344  047330         CMP     FLTPAT,CDR150       ;CHECK FOR CORRECT PATTERN
2602 015176  001410                         BEQ     9$                  ;PASS
2603 015200  013737  047344  047332         MOV     FLTPAT,EXDAT6       ;SAVE FLOATING PATTERN FOR TYPEOUT
2604 015206  104406                         ERROR                       ;ERROR
                                                                        ;-----
     015210  015206                         .WORD   .-2
2605                                                                    ; DATA STORE TESTS
2606                                                                    ;READING CDR<15:0> DID NOT RESULT
2607                                                                    ;IN CORRECT FLOATING 1 PATTERN
2608 015212  047332                 EXDAT6                             ;PRINT FLOATING PATTERN EXPECTED
2609 015214  047330                 CDR150                             ;PRINT CDR<15:0> DATA READ.
2610 015216  000000                         .WORD   0
2611 015220  006337  047344         9$:     ASL     FLTPAT              ;NEXT PATTERN
2612 015224  103401                         BCS     10$                 ;IF PATTERN 100000 HAS BEEN DONE;FINISHED
2613 015226  000727                         BR      2$                  ;IF NOT, NEXT PASS
2614 015230  000240             10$:        NOP                         ;END OF TEST
     015232  005237  001472                 INC     $TESTN              ;INCREMENT TEST COUNTER
```

```
                                        .SBTTL  TEST # 110 - CLEAR ALL LOW CACHE  DATA STORE LOCATIONS
                                        ;;*****************************************************************
                                        ;*TEST 110 - CLEAR ALL LOW CACHE  DATA STORE LOCATIONS
                                        ;*      WRITE ALL 0'S INTO ALL LOW CACHE  DATA STORE LOCATIONS (0000 TO 3777).
                                        ;*      READ ALL 0'S EACH CACHE LOCATION FROM CACHE DATA REGISTER.
                                        ;;*****************************************************************
     015236                             TST110:
2620 015236  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     015240  015250                             .WORD   40$             ;TEST START LOCATION
     015242  070024                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     015244  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     015246  070054                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     015250  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     015256  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     015262  015430                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

2621 015264  012705  060000                     MOV     #60000,R5       ;ADDRESS 60000 INTO R5
2622 015270  005025                     5$:     CLR     (R5)+           ;CLEAR MAIN MEMORY LOW CACHE AREA
2623 015272  020527  070000                     CMP     R5,#70000       ;FINISHED?
2624 015276  001374                             BNE     5$              ;NO
2625 015300  012705  060000                     MOV     #60000,R5       ;START WITH ADDRESS 60000
2626 015304  012703  040000                     MOV     #40000,R3       ;ADDRESS 40000 INTO R3
2627 015310  112737  000002  177750  1$:       MOVB    #HODO,CMR       ;ALLOWS CACHE DATA STORE BITS TO BE
2628                                                                    ;WRITTEN TO CDR<15:0> ONLY DURING THE
2629                                                                    ;DESTINATION MEMORY ACCESS OF AN INSTRUCTION.
2630 015316  012737  000015  177746             MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE CACHE STORE
2631 015324  005713                             TST     (R3)            ;
2632 015326  005715                             TST     (R5)            ;WRITE ALL 0'S TO DATA STORE FROM MAIN MEM.
2633 015330  005715                             TST     (R5)            ;WRITE DATA STORE BITS INTO CDR<15:0>
2634 015332  013737  177754  047330             MOV     CDR,CDR150      ;SAVE CDR CONTENTS
2635 015340  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     015342  000240                             NOP                     ;FOR  LOOP ON ERROR
2636 015344  105037  177750                     CLRB    CMR             ;DISABLE MAINTENANCE
2637 015350  012737  001015  177746             MOV     #OFF,CCR        ;DISABLE CACHE
2638 015356  022737  000000  047330             CMP     #0,CDR150       ;CHECK ALL 0'S
2639 015364  001411                             BEQ     9$              ;PASS
2640 015366  010537  047314                     MOV     R5,CA210+2      ;SAVE ADDRESS USED THIS PASS
2641 015372  005037  047312                     CLR     CA210
2642 015376  104406                             ERROR                   ;ERROR
                                                                        ;-----
     015400  015376                             .WORD   .-2
2643                                                                    ; DATA STORE TESTS
2644                                                                    ;READING CDR<15:0> DID NOT RESULT
2645                                                                    ;IN ALL 0'S
2646 015402  047312                             CA210                   ;PRINT CA<21:0> USED
2647 015404  047330                             CDR150                  ;PRINT CDR<15:0> DATA READ.
2648 015406  000000                             .WORD   0
2649 015410  062705  000002             9$:     ADD     #2,R5           ;NEXT CACHE LOCATION
2650 015414  062703  000002                     ADD     #2,R3
2651 015420  022705  070000                     CMP     #70000,R5       ;HAVE ALL LOW CACHE LOCATIONS BEEN DONE?
2652 015424  001331                             BNE     1$              ;NO
2653 015426  000240                     10$:    NOP                     ;END OF TEST
     015430  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                        .SBTTL  TEST # 111 - SET ALL LOW CACHE DATA STORE LOCATIONS
                                        ;;*****************************************************************
                                        ;*TEST 111 - SET ALL LOW CACHE DATA STORE LOCATIONS
                                        ;*      WRITE ALL 1'S INTO ALL LOW CACHE  DATA STORE LOCATIONS (0000 TO 3777).
                                        ;*      READ ALL 1'S EACH CACHE LOCATION FROM CACHE DATA REGISTER.
                                        ;;*****************************************************************
     015434                             TST111:
2659 015434  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     015436  015446                             .WORD   40$             ;TEST START LOCATION
     015440  070026                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     015442  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     015444  070056                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     015446  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     015454  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     015460  015630                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

2660 015462  012705  060000             5$:     MOV     #60000,R5       ;ADDRESS 60000 INTO R5
2661 015466  012725  177777                     MOV     #-1,(R5)+       ;1'S TO MAIN MEMORY LOW CACHE AREA
2662 015472  020527  070000                     CMP     R5,#70000       ;FINISHED?
2663 015476  001373                             BNE     5$              ;NO
2664 015500  012705  060000                     MOV     #60000,R5       ;START WITH ADDRESS 60000
2665 015504  012703  040000                     MOV     #40000,R3       ;ADDRESS 40000 INTO R3
2666 015510  112737  000002  177750  1$:       MOVB    #HODO,CMR       ;ALLOWS CACHE DATA STORE BITS TO BE
2667                                                                    ;WRITTEN TO CDR<15:0> ONLY DURING THE
2668                                                                    ;DESTINATION MEMORY ACCESS OF AN INSTRUCTION.
2669 015516  012737  000015  177746             MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE CACHE STORE
2670 015524  005713                             TST     (R3)            ;
2671 015526  005715                             TST     (R5)            ;WRITE ALL 1'S TO DATA STORE FROM MAIN MEM.
2672 015530  005715                             TST     (R5)            ;WRITE DATA STORE BITS INTO CDR<15:0>
2673 015532  013737  177754  047330             MOV     CDR,CDR150      ;SAVE CDR CONTENTS
2674 015540  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     015542  000240                             NOP                     ;FOR  LOOP ON ERROR
2675 015544  105037  177750                     CLRB    CMR             ;DISABLE MAINTENANCE
2676 015550  012737  001015  177746             MOV     #OFF,CCR        ;DISABLE CACHE
2677 015556  022737  177777  047330             CMP     #-1,CDR150      ;CHECK ALL 1'S
2678 015564  001411                             BEQ     9$              ;PASS
2679 015566  010537  047314                     MOV     R5,CA210+2      ;SAVE ADDRESS USED THIS PASS
2680 015572  005037  047312                     CLR     CA210
2681 015576  104406                             ERROR                   ;ERROR
                                                                        ;-----
     015600  015576                             .WORD   .-2
2682                                                                    ; DATA STORE TESTS
2683                                                                    ;READING CDR<15:0> DID NOT RESULT
2684                                                                    ;IN ALL 1'S
2685 015602  047312                             CA210                   ;PRINT CA<21:0> USED
2686 015604  047330                             CDR150                  ;PRINT CDR<15:0> DATA READ.
2687 015606  000000                             .WORD   0
2688 015610  062705  000002             9$:     ADD     #2,R5           ;NEXT CACHE LOCATION
2689 015614  062703  000002                     ADD     #2,R3
2690 015620  022705  070000                     CMP     #70000,R5       ;HAVE ALL LOW CACHE LOCATIONS BEEN DONE?
2691 015624  001331                             BNE     1$              ;NO
2692 015626  000240                     10$:    NOP                     ;END OF TEST
     015630  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                        .SBTTL  TEST # 112 - CLEAR ALL HIGH CACHE DATA STORE LOCATIONS
                                        ;;*********************************************************************
                                        ;*TEST 112 - CLEAR ALL HIGH CACHE DATA STORE LOCATIONS
                                        ;*      WRITE ALL 0'S INTO ALL HIGH CACHE  DATA STORE LOCATIONS (4000 TO 7777).
                                        ;*      READ ALL 0'S EACH CACHE LOCATION FROM CACHE DATA REGISTER.
                                        ;;*********************************************************************
     015634                             TST112:
2698 015634  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     015636  015646                             .WORD   40$             ;TEST START LOCATION
     015640  060024                             .WORD   1$-40$+57764    ;LOOP ON ERROR START LOCATION
     015642  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     015644  060054                             .WORD   25$-40$+57764   ;LOOP ON ERROR END LOCATION
     015646  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     015654  004437  002342                     JSR     R4,RELCTL       ;LOCATE TEST CODE TO LOW CACHE SPACE
     015660  016026                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO LOW CACHE SPACE

2699 015662  012705  070000                     MOV     #70000,R5       ;ADDRESS 70000 INTO R5
2700 015666  005025                     5$:     CLR     (R5)+           ;CLEAR MAIN MEMORY HI CACHE AREA
2701 015670  020527  100000                     CMP     R5,#100000      ;FINISHED?
2702 015674  001374                             BNE     5$              ;NO
2703 015676  012705  070000                     MOV     #70000,R5       ;START WITH ADDRESS 70000
2704 015702  012703  050000                     MOV     #50000,R3       ;ADDRESS 50000 INTO R3
2705 015706  112737  000002  177750  1$:       MOVB    #HODO,CMR       ;ALLOWS CACHE DATA STORE BITS TO BE
2706                                                                    ;WRITTEN TO CDR<15:0> ONLY DURING THE
2707                                                                    ;DESTINATION MEMORY ACCESS OF AN INSTRUCTION.
2708 015714  012737  000015  177746             MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE CACHE STORE
2709 015722  005713                             TST     (R3)            ;
2710 015724  005715                             TST     (R5)            ;WRITE ALL 0'S TO DATA STORE FROM MAIN MEM.
2711 015726  005715                             TST     (R5)            ;WRITE DATA STORE BITS INTO CDR<15:0>
2712 015730  013737  177754  047330             MOV     CDR,CDR150      ;SAVE CDR CONTENTS
2713 015736  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     015740  000240                             NOP                     ;FOR  LOOP ON ERROR
2714 015742  105037  177750                     CLRB    CMR             ;DISABLE MAINTENANCE
2715 015746  012737  001015  177746             MOV     #OFF,CCR        ;DISABLE CACHE
2716 015754  022737  000000  047330             CMP     #0,CDR150       ;CHECK ALL 0'S
2717 015762  001411                             BEQ     9$              ;PASS
2718 015764  010537  047314                     MOV     R5,CA210+2      ;SAVE ADDRESS USED THIS PASS
2719 015770  005037  047312                     CLR     CA210
2720 015774  104406                             ERROR                   ;ERROR
                                                                        ;-----
     015776  015774                             .WORD   .-2
2721                                                                    ; DATA STORE TESTS
2722                                                                    ;READING CDR<15:0> DID NOT RESULT
2723                                                                    ;IN ALL 0'S
2724 016000  047312                             CA210                   ;PRINT CA<21:0> USED
2725 016002  047330                             CDR150                  ;PRINT CDR<15:0> DATA READ.
2726 016004  000000                             .WORD   0
2727 016006  062705  000002             9$:     ADD     #2,R5           ;NEXT CACHE LOCATION
2728 016012  062703  000002                     ADD     #2,R3
2729 016016  022705  100000                     CMP     #100000,R5      ;HAVE ALL HIGH CACHE LOCATIONS BEEN DONE?
2730 016022  001331                             BNE     1$              ;NO
2731 016024  000240                     10$:    NOP                     ;END OF TEST
     016026  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                        .SBTTL  TEST # 113 - SET ALL HIGH CACHE DATA STORE LOCATIONS
                                        ;;*****************************************************************
                                        ;*TEST 113 - SET ALL HIGH CACHE DATA STORE LOCATIONS
                                        ;*      WRITE ALL 1'S INTO ALL HIGH CACHE  DATA STORE LOCATIONS (4000 TO 7777).
                                        ;*      READ ALL 1'S EACH CACHE LOCATION FROM CACHE DATA REGISTER.
                                        ;;*****************************************************************
     016032
2737 016032  000004                    TST113:
                                               SCPCND                   ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     016034  016044                            .WORD   40$              ;TEST START LOCATION
     016036  060026                            .WORD   1$-40$+57764     ;LOOP ON ERROR START LOCATION
     016040  000000                            .WORD   0                ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     016042  060056                            .WORD   25$-40$+57764    ;LOOP ON ERROR END LOCATION
     016044  012737  001015  177746  40$:      MOV     #OFF,CCR         ;DISABLE CACHE
     016052  004437  002342                    JSR     R4,RELCTL        ;LOCATE TEST CODE TO LOW CACHE SPACE
     016056  016226                            .WORD   10$+2            ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO LOW CACHE SPACE

2738 016060  012705  070000                    MOV     #70000,R5        ;ADDRESS 70000 INTO R5
2739 016064  012725  177777            5$:     MOV     #-1,(R5)+        ;1'S TO MAIN MEMORY HI CACHE AREA
2740 016070  020527  100000                    CMP     R5,#100000       ;FINISHED?
2741 016074  001373                            BNE     5$               ;NO
2742 016076  012705  070000                    MOV     #70000,R5        ;START WITH ADDRESS 70000
2743 016102  012703  050000                    MOV     #50000,R3        ;ADDRESS 50000 INTO R3
2744 016106  112737  000002  177750  1$:      MOVB    #HODO,CMR        ;ALLOWS CACHE DATA STORE BITS TO BE
2745                                                                    ;WRITTEN TO CDR<15:0> ONLY DURING THE
2746                                                                    ;DESTINATION MEMORY ACCESS OF AN INSTRUCTION.
2747 016114  012737  000015  177746          MOV     #15,CCR          ;NO UCB SO AS TO WRITE ENABLE CACHE STORE
2748 016122  005713                            TST     (R3)             ;
2749 016124  005715                            TST     (R5)             ;WRITE ALL 1'S TO DATA STORE FROM MAIN MEM.
2750 016126  005715                            TST     (R5)             ;WRITE DATA STORE BITS INTO CDR<15:0>
2751 016130  013737  177754  047330          MOV     CDR,CDR150       ;SAVE CDR CONTENTS
2752 016136  000240                    25$:    NOP                      ;INSTRUCTION 'JMP 1$' PLACED HERE
     016140  000240                            NOP                      ;FOR  LOOP ON ERROR
2753 016142  105037  177750                    CLRB    CMR              ;DISABLE MAINTENANCE
2754 016146  012737  001015  177746          MOV     #OFF,CCR         ;DISABLE CACHE
2755 016154  022737  177777  047330          CMP     #-1,CDR150       ;CHECK ALL 1'S
2756 016162  001411                            BEQ     9$               ;PASS
2757 016164  010537  047314                    MOV     R5,CA210+2       ;SAVE ADDRESS USED THIS PASS
2758 016170  005037  047312                    CLR     CA210
2759 016174  104406                            ERROR                    ;ERROR
                                                                        ;-----
     016176  016174                            .WORD   .-2
2760                                                                    ; DATA STORE TESTS
2761                                                                    ;READING CDR<15:0> DID NOT RESULT
2762                                                                    ;IN ALL 1'S
2763 016200  047312                            CA210                    ;PRINT CA<21:0> USED
2764 016202  047330                            CDR150                   ;PRINT CDR<15:0> DATA READ.
2765 016204  000000                            .WORD   0
2766 016206  062705  000002            9$:     ADD     #2,R5            ;NEXT CACHE LOCATION
2767 016212  062703  000002                    ADD     #2,R3
2768 016216  022705  100000                    CMP     #100000,R5       ;HAVE ALL LOW CACHE LOCATIONS BEEN DONE?
2769 016222  001331                            BNE     1$               ;NO
2770 016224  000240                    10$:    NOP                      ;END OF TEST
     016226  005237  001472                    INC     $TESTN           ;INCREMENT TEST COUNTER
```

TEST # 114 - VERIFY CACHE DATA STORE ADDRESS LINES (CA(12:1))

```
2774                                    .SBTTL  TEST # 114 - VERIFY CACHE DATA STORE ADDRESS LINES (CA(12:1))
                                        ;;*****************************************************************
                                        ;*TEST 114 - VERIFY CACHE DATA STORE ADDRESS LINES (CA(12:1))
                                        ;*      VERIFY CACHE DATA STORE ADDRESS LINES (CA<12:1>)
                                        ;;*****************************************************************
     016232                             TST114:
2775 016232  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     016234  016244                             .WORD   40$             ;TEST START LOCATION
     016236  070040                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     016240  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     016242  070100                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     016244  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     016252  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     016256  016450                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

2776 016260  000240                             NOP
2777                                                                    ;WHEN THE TEST IS RELOCATED.ADDRESS 70000
2778                                                                    ;WILL BE LOADED WITH ALL 1'S DURING TEST
2779 016262  005037  060000                     CLR     60000           ;ALL 0'S TO MAIN MEMORY
2780 016266  012737  000002  047344             MOV     #2,FLTPAT       ;1ST FLOATING CACHE DATA STORE ADDRESS PATTERN
2781 016274  012702  040000             2$:     MOV     #40000,R2       ;
2782 016300  012703  060000                     MOV     #60000,R3       ;
2783 016304  063702  047344                     ADD     FLTPAT,R2       ;R2 CONTAINS 40000+FLTPAT
2784 016310  063703  047344                     ADD     FLTPAT,R3       ;R3 CONTAINS 60000+FLTPAT
2785 016314  012713  177777                     MOV     #-1,(R3)        ;ALL 1'S TO MAIN MEM. LOCATION
2786                                                                    ;SPECIFIED BY R3
2787 016320  112737  000002  177750  1$:       MOVB    #HODO,CMR       ;ALLOWS CACHE DATA STORE BITS TO BE
2788                                                                    ;WRITTEN TO CDR<15:0> ONLY DURING THE
2789                                                                    ;DESTINATION MEMORY ACCESS OF AN INSTRUCTION.
2790 016326  012737  000015  177746             MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE CACHE STORE
2791 016334  005737  040000                     TST     40000
2792 016340  005737  060000                     TST     60000           ;WRITE ALL 0'S FROM MAIN MEM. LOCATION
2793                                                                    ;60000 INTO CACHE DATA STORE LOCATION 0000.
2794 016344  005712                             TST     (R2)
2795 016346  005713                             TST     (R3)            ;WRITE ALL 1'S FROM MAIN MEM. INTO
2796                                                                    ;CACHE DATA STORE LOCAT. SPECIFIED
2797                                                                    ;BY R3'S BITS 1 THRU 12: CA<12:1>
2798 016350  005737  060000                     TST     60000           ;LOAD DATA FROM CACHE DATA STORE LOCATION
2799                                                                    ;0000 INTO CDR.
2800 016354  013701  177754                     MOV     CDR,R1          ;SAVE CDR DATA
2801 016360  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     016362  000240                             NOP                     ;FOR  LOOP ON ERROR
2802 016364  105037  177750                     CLRB    CMR             ;DISABLE MAINT. MODE
2803 016370  012737  001015  177746             MOV     #OFF,CCR        ;DISABLE CACHE
2804 016376  005701                             TST     R1              ;CHECK FOR ALL 0'S
2805 016400  001411                             BEQ     9$              ;PASS
2806
2807 016402  013737  047344  047334             MOV     FLTPAT,CA121    ;SAVE CA<12:1> USED
2808 016410  006237  047334                     ASR     CA121           ;PREPARE CA121 FOR TYPEOUT
2809 016414  104406                             ERROR                   ;ERROR
                                                                        ;-----
     016416  016414                             .WORD   .-2
2810                                                                    ;DATA STORE TESTS- ADDRESS LINE VERIFICATION
```

TEST # 114 - VERIFY CACHE DATA STORE ADDRESS LINES (CA(12:1))

```
2811                                                                    ;READING CDR<15:0> FOR CACHE DATA STORE
2812                                                                    ;DID NOT RESULT IN ALL 0'S
2813 016420  047334                          CA121                     ;PRINT CACHE DATA STORE ADDRESS LOCATION
2814                                                                    ;USED: CA<12:1>. NOTE THAT THE 1 IN
2815                                                                    ;THIS PATTERN WILL POINT TO THE ADDRESS
2816                                                                    ;LINE THAT POSSIBLY CAUSES ERROR.
2817 016422  000000                          .WORD   0
2818 016424  006337  047344          9$:     ASL     FLTPAT            ;NEXT PATTERN
2819 016430  022737  020000  047344          CMP     #20000,FLTPAT     ;HAS CACHE DATA STORE LOCAT. 4000 BEEN DONE?
2820 016436  001316                          BNE     2$                ;NO
2821 016440  012737  000240  070000          MOV     #240,70000        ;RESTORE OVERWRITTEN LOCATION 7000 WITH A NOP
2822 016446  000240                  10$:    NOP                       ;END OF TEST
     016450  005237  001472                  INC     $TESTN            ;INCREMENT TEST COUNTER
```

```
TEST # 115 - CHECK EQUAL DATA COMPARISON CONDITION
   2830                                 .SBTTL  TEST # 115 - CHECK EQUAL DATA COMPARISON CONDITION
                                        ;;*****************************************************************
                                        ;*TEST 115 - CHECK EQUAL DATA COMPARISON CONDITION
                                        ;*      VERIFY THAT AN EQUAL DATA COMPARISON CONDITION CAN EXIST
                                        ;*      BY COMPARING TAG STORE DATA AND CA<21:13>
                                        ;*      UNDER THE FOLLOWING CONDITIONS CMR<15:13> SHOULD RESULT IN ALL
                                        ;*      1'S INDICATING A MATCH :
                                        ;*      TAG STORE DATA AND CA<21:13> ALL 0'S
                                        ;;*****************************************************************
        016454                          TST115:
   2831 016454  000004                          SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
        016456  016466                          .WORD   40$             ;TEST START LOCATION
        016460  070000                          .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
        016462  000000                          .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
        016464  070036                          .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
        016466  012737  001015  177746  40$:    MOV     #OFF,CCR        ;DISABLE CACHE
        016474  004437  002370                  JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
        016500  016644                          .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

   2832 016502  112737  000002  177750  1$:     MOVB    #HODO,CMR       ;ALLOWS COMPARED RESULTS TO BE
   2833                                                                 ;WRITTEN TO CMR<15:13> ONLY DURING
   2834                                                                 ;THE DESTINATION MEMORY ACCESS
   2835                                                                 ;OF AN INSTRUCTION
   2836 016510  012737  000015  177746          MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE CACHE STORE
   2837 016516  005737  040000                  TST     40000
   2838 016522  005737  000000                  TST     0               ;WRITE ALL 0'S INTO TAG STORE LOCATION 0000
   2839                                                                 ;FROM CACHE ADDRESS CA<21:13>
   2840 016526  005737  000000                  TST     0               ;PLACE ALL 0'S ON CA<21:13> FOR COMPARISON
   2841                                                                 ;WITH TAG STORE DATA. WRITE COMPARED
   2842                                                                 ;RESULTS INDICATION IN CMR<15:13>
   2843 016532  013737  177750  047340          MOV     CMR,CM1513      ;SAVE CMR DATA
   2844 016540  000240                  25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
        016542  000240                          NOP                     ;FOR  LOOP ON ERROR
   2845 016544  105037  177750                  CLRB    CMR             ;DISABLE MAINTENANCE MODE
   2846 016550  012737  001015  177746          MOV     #OFF,CCR        ;DISABLE CACHE
   2847 016556  042737  017777  047340          BIC     #17777,CM1513
   2848 016564  022737  160000  047340          CMP     #160000,CM1513  ;CHECK THAT CMR<15:13> ALL 1'S
   2849 016572  001423                          BEQ     10$             ;PASS
   2850 016574  012737  000007  047336          MOV     #7,EXDAT1       ;INDICATE EXPECTED CMR<15:13>
   2851 016602  012737  000015  002062          MOV     #13.,LOOP       ;ERROR;PREPARE CM1513. FOR TYPEOUT
   2852 016610  006237  047340          2$:     ASR     CM1513
   2853 016614  042737  100000  047340          BIC     #100000,CM1513
   2854 016622  005337  002062                  DEC     LOOP
   2855 016626  001370                          BNE     2$
   2856 016630  104406                          ERROR                   ;ERROR
                                                                        ;-----
        016632  016630                          .WORD   .-2
   2857                                                                 ;COMPARE TAG STORE & CA<21:13> TESTS
   2858                                                                 ;BITS 15 THRU 13 OF CMR DID NOT READ
   2859                                                                 ;AS ALL 1'S
   2860 016634  047336                  EXDAT1                         ;PRINT CMR<15:13> DATA EXPECTED
   2861 016636  047340                  CM1513                         ;PRINT CMR<15:13> DATA RECEIVED
   2862 016640  000000                  .WORD   0
```

TEST # 115 - CHECK EQUAL DATA COMPARISON CONDITION

```
 2863 016642  000240                    10$:    NOP                     ;END OF TEST
      016644  005237  001472                    INC     $TESTN          ;INCREMENT TEST COUNTER
```

TEST # 116 - UNEQUAL DATA COMPARISON CONDITION CAN BE DETECTED

```
                                        .SBTTL  TEST # 116 - UNEQUAL DATA COMPARISON CONDITION CAN BE DETECTED
                                        ;;*****************************************************************
                                        ;*TEST 116 - UNEQUAL DATA COMPARISON CONDITION CAN BE DETECTED
                                        ;*      VERIFY THAT AN UNEQUAL DATA COMPARISON CONDITION CAN BE DETECTED
                                        ;*      BY COMPARING TAG STORE AND CA<21:13>
                                        ;*      UNDER THE FOLLOWING CONDITIONS FOR TAG STORE DATA AND CA<21:13>
                                        ;*      CMR<15:13> SHOULD READ AS SPECIFIED IN TABLE DEFINED BY TAGS 30$
                                        ;*      TO 38$.
                                        ;;*****************************************************************
016650                                  TST116:
2872 016650  000411                            BR      39$             ;BRANCH OVER TABLE
2873                                    ;               CMR<15:13>      CA<21:13>       TAG STORE
2874                                    ;               ---------       --------        ---------
2875 016652  000006                    30$:    .WORD       6           ;  001          000
2876 016654  000005                    31$:    .WORD       5           ;  002          000
2877 016656  000005                    32$:    .WORD       5           ;  004          000
2878 016660  000005                    33$:    .WORD       5           ;  010          000
2879 016662  000005                    34$:    .WORD       5           ;  020          000
2880 016664  000003                    35$:    .WORD       3           ;  040          000
2881 016666  000003                    36$:    .WORD       3           ;  100          000
2882 016670  000003                    37$:    .WORD       3           ;  200          000
2883 016672  000003                    38$:    .WORD       3           ;  400          000
2884 016674                             39$:
     016674  000004                            SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     016676  016706                            .WORD   40$             ;TEST START LOCATION
     016700  070012                            .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     016702  000000                            .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     016704  070104                            .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     016706  012737  001015  177746    40$:    MOV     #OFF,CCR        ;DISABLE CACHE
     016714  004437  002370                    JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     016720  017236                            .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

2885 016722  012737  000200  172350    2$:     MOV     #200,KPAR4      ;KPAR4 CONTAINS THE FLOATING 1 PATTERN
2886                                                                    ;AND REPRESENTS THE THE PAGE ADDRESS FIELD
2887                                                                    ;DATA USED BY MEMORY MNGMNT. TO CONSTRUCT
2888                                                                    ;THE PHYSICAL ADDRESS.  200 IS THE 1ST
2889                                                                    ;FLOATING 1 PATTERN WHICH WILL BE CONSTRUCTED
2890                                                                    ;TO ADDRESS 20000.
2891 016730  012701  016652                    MOV     #30$,R1         ;SAVE ADDRESS OF FIRST CMR<15:13>
2892                                                                    ;EXPECTED DATA
2893 016734  012737  070254  000004    1$:     MOV     #7$-2$+70000,4  ;ALLOW FOR NEX TRAP
2894 016742  012737  000340  000006            MOV     #340,6
2895 016750  112737  000002  177750            MOVB    #HODO,CMR       ;ALLOWS COMPARED RESULTS TO BE WRITTEN
2896                                                                    ;TO CMR<15:13> ONLY DURING THE DESTINATION
2897                                                                    ;MEMORY ACCESS OF AN INSTRUCTION.
2898 016756  012737  000015  177746            MOV     #15,CCR         ;NO UCB SO AS TO WRITE CACHE STORE
2899 016764  012737  000001  177572            MOV     #1,SR0          ;ENABLE MEMORY MNGMNT.
2900 016772  012737  000020  172516            MOV     #20,SR3         ;ENABLE 22-BIT MAPPING
2901 017000  005737  040000                    TST     40000           ;
2902 017004  005737  000000                    TST     0               ;WRITE ALL 0'S TO TAG STORE LOCATION 0000
2903 017010  005737  100000                    TST     100000          ;CHOOSES KPAR4 FOR ADDRESSING. PHYSICAL
2904                                                                    ;ADDRESS WILL BE DETERMINED BY FLOATING
2905                                                                    ;PATTERN USED IN KPAR4.
```

```
                                                                        ;PLACE DLOATING PATTERN ON CA<21:13>
                                                                        ;FOR COMPARISON WITH TAG STORE DATA
                                                                        ;AT LOCATION 0000. WRITE THE COMPARED
                                                                        ;RESULT INDICATION INTO CMR<15:13>.
017014  000240                          NOP
017016  000240                          NOP
017020  013737  177750  047340        MOV     CMR,CM1513      ;SAVE CMR DATA
017026  000240                  25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
017030  000240                          NOP                     ;FOR  LOOP ON ERROR
017032  005037  177572                  CLR     SR0             ;DISABLE MEM MNGMENT.
017036  005037  172516                  CLR     SR3
017042  012737  001015  177746        MOV     #OFF,CCR        ;DISABLE CACHE
017050  105037  177750                  CLRB    CMR             ;DISABLE MAINTENANCE
017054  012737  000015  002062        MOV     #13.,LOOP       ;PREPARE CM1513.  FOR ERROR CHECK
017062  006237  047340          5$:     ASR     CM1513
017066  042737  100000  047340        BIC     #100000,CM1513
017074  005337  002062                  DEC     LOOP
017100  001370                          BNE     5$
017102  023711  047340                  CMP     CM1513,(R1)     ;COMPARE CMR<15:13> RECEIVED WITH
                                                                ;EXPECTED
017106  001426                          BEQ     9$              ;PASS
017110  013737  172350  047324        MOV     KPAR4,CA2113    ;SAVE PATTERN USED FOR CA<21:13>
017116  012737  000007  002062        MOV     #7,LOOP         ;PREPARE CA2113 FOR PRINTOUT
017124  006237  047324          6$:     ASR     CA2113
017130  042737  100000  047324        BIC     #100000,CA2113
017136  005337  002062                  DEC     LOOP
017142  001370                          BNE     6$
017144  011137  047336                  MOV     (R1),EXDAT1     ;PREPARE EXPECTED FOR PRINTOUT
017150  104406                          ERROR                   ;ERROR
                                                                ;-----
017152  017150                          .WORD   .-2
                                                                ;COMPARE TAG STORE AND CA<21:13> TESTS
                                                                ;CMR<15:13> DID NOT READ CORRECTLY
017154  047324                          CA2113                  ;PRINT CA<21:13> PATTERN USED ON ADDRESS
                                                                ;LINES
017156  047336                          EXDAT1                  ;PRINT CMR<15:13> EXPECTED
017160  047340                          CM1513                  ;PRINT CMR<15:13> RECEIVED
017162  000000                          .WORD   0               ;PRINT TERMINATE
017164  006337  172350          9$:     ASL     KPAR4           ;NEXT PATTERN;IF PHYSICAL ADDRESS
                                                                ;10000000 HAS BEEN DONE; FINISHED
017170  103414                          BCS     8$              ;
017172  005721                          TST     (R1)+           ;NOT FINISHED; POINT TO NEXT
                                                                ;CMR<15:13> EXPECTED
017174  000657                          BR      1$              ;CONTINUE WITH TEST
017176  005037  177572          7$:     CLR     SR0             ;DISABLE MEM. MNGMNT.
017202  005037  172516                  CLR     SR3
017206  105037  177750                  CLRB    CMR             ;DISABLE MAINTENANCE
017212  012737  001015  177746        MOV     #OFF,CCR        ;DISABLE CACHE
017220  022626                          CMP     (SP)+,(SP)+     ;RESTORE STACK DUE TO INTERRUPT
017222  012737  000006  000004  8$:     MOV     #6,4            ;RESTORE VECTORS
017230  005037  000006                  CLR     6               ;
017234  000240                  10$:    NOP                     ;END OF TEST
017236  005237  001472                  INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 117 - TEST FLUSH IN PROGRESS BIT
                                ;;*****************************************************************
                                ;*TEST 117 - TEST FLUSH IN PROGRESS BIT
                                ;*      VERIFY FLUSH IN PROGRESS BIT WILL SET AS A RESULT OF FLUSH
                                ;;*****************************************************************
     017242                     TST117:
2959 017242  000004                    SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                               ;ERROR/LOOP ON TEST
     017244  017254                    .WORD   40$             ;TEST START LOCATION
     017246  017254                    .WORD   1$              ;LOOP ON ERROR START LOCATION
     017250  000000                    .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     017252  017310                    .WORD   25$             ;LOOP ON ERROR END LOCATION
     017254                     40$:
2960 017254  005002            1$:     CLR     R2              ;INITIALIZE COUNTER
2961 017256  005037  002070            CLR     FAIL1           ;INITIALIZE ERROR FLAG
2962 017262  052737  000400  177746    BIS     #FC,CCR         ;FLUSH CACHE
2963 017270  032737  010000  177746    BIT     #VCIP,CCR       ;VERIFY FLUSH IN PROGRESS
2964 017276  001002                    BNE     3$              ;VCIP BIT IS SET
2965 017300  005237  002070            INC     FAIL1           ;INDICATE ERROR
2966 017304  005302            3$:     DEC     R2              ;WAIT DELAY FOR FLUSH TO COMPLETE
2967 017306  001376                    BNE     3$
2968 017310  000240            25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     017312  000240                    NOP                     ;FOR  LOOP ON ERROR
2969 017314  005737  002070            TST     FAIL1           ;IS THERE ERROR
2970 017320  001403                    BEQ     10$             ;PASS
2971 017322  104406                    ERROR                   ;ERROR
                                                               ;-----
     017324  017322                    .WORD   .-2
2972                                                           ;FLUSH CACHE TESTS
2973                                                           ;FLUSH IN PROGRESS BIT(VCIP) FAILED
2974                                                           ;TO SET AS A RESULT OF SETTING CACHE FLUSH BIT
2975 017326  000000                    .WORD   0
2976 017330  000240            10$:    NOP                     ;END OF TEST
     017332  005237  001472            INC     $TESTN          ;INCREMENT TEST COUNTER
```

TEST # 120 - TEST FLUSH IN PROGRESS BIT(VCIP) WILL RESET

```
                                .SBTTL  TEST # 120 - TEST FLUSH IN PROGRESS BIT(VCIP) WILL RESET
                                ;;*****************************************************************
                                ;*TEST 120 - TEST FLUSH IN PROGRESS BIT(VCIP) WILL RESET
                                ;*      VERIFY FLUSH IN PROGRESS BIT(VCIP) WILL RESET ON COMPLETION OF FLUSH
                                ;;*****************************************************************
     017336                     TST120:
2981 017336  000004                     SCPCND                 ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                ;ERROR/LOOP ON TEST
     017340  017350                     .WORD   40$            ;TEST START LOCATION
     017342  017350                     .WORD   1$             ;LOOP ON ERROR START LOCATION
     017344  000000                     .WORD   0              ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     017346  017374                     .WORD   25$            ;LOOP ON ERROR END LOCATION
     017350                     40$:
2982 017350  005002            1$:      CLR     R2             ;INITIALIZE COUNTER
2983 017352  052737  000400  177746     BIS     #FC,CCR        ;START FLUSH
2984 017360  032737  010000  177746  3$:BIT     #VCIP,CCR      ;SEE IF FLUSH COMPLETE
2985 017366  001407                     BEQ     10$            ;FLUSH COMPLETE
2986 017370  005302                     DEC     R2             ;SEE IF TIME HAS RUN OUT
2987 017372  001372                     BNE     3$             ;NOT YET
2988 017374  000240            25$:     NOP                    ;INSTRUCTION 'JMP 1$' PLACED HERE
     017376  000240                     NOP                    ;FOR  LOOP ON ERROR
2989 017400  104406                     ERROR                  ;ERROR
                                                                ;-----
     017402  017400                     .WORD   .-2
2990                                                            ;FLUSH CACHE TESTS
2991                                                            ;FLUS IN PROGRESS BIT FAILED TO CLEAR
2992                                                            ;TIME FOR FLUSH TO COMPLETE RAN OUT
2993 017404  000000                     .WORD   0
2994 017406  000240            10$:     NOP                    ;END OF TEST
     017410  005237  001472             INC     $TESTN         ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 121 - CHECK THAT VSIU BIT SETS
                                ;;*********************************************************************
                                ;*TEST 121 - CHECK THAT VSIU BIT SETS
                                ;*      VERIFY THAT VSIU BIT WILL CHANGE FROM A CLEAR TO SET CONDITION AS
                                ;*      A RESULT OF CACHE FLUSH
                                ;;*********************************************************************
     017414                     TST121:
3000 017414  000004                     SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                ;ERROR/LOOP ON TEST
     017416  017426                     .WORD   40$             ;TEST START LOCATION
     017420  017426                     .WORD   1$              ;LOOP ON ERROR START LOCATION
     017422  000000                     .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     017424  017472                     .WORD   25$             ;LOOP ON ERROR END LOCATION
     017426                     40$:
3001 017426  032737  020000  177746 1$:     BIT     #VSIU,CCR       ;IS SET A BEING USED
3002 017434  001407                     BEQ     3$              ;YES
3003 017436  052737  000400  177746         BIS     #FC,CCR         ;CAUSE FLUSH FOR SET A
3004 017444  032737  010000  177746 200$:   BIT     #VCIP,CCR       ;WAIT FOR FLUSH TO COMPLETE
3005 017452  001374                     BNE     200$
3006 017454  052737  000400  177746 3$:     BIS     #FC,CCR         ;CAUSE FLUSH
3007 017462  032737  010000  177746 4$:     BIT     #VCIP,CCR       ;WAIT FOR FLUSH TO COMPLETE
3008 017470  001374                     BNE     4$
3009 017472  000240                25$:  NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     017474  000240                     NOP                     ;FOR  LOOP ON ERROR
3010 017476  032737  020000  177746         BIT     #VSIU,CCR       ;IS VSIU BIT =1 INDICATING VALID SET
3011                                                            ;B WAS SELECTED
3012 017504  001003                     BNE     10$             ;PASS
3013 017506  104406                     ERROR                   ;ERROR
                                                                ;-----
     017510  017506                     .WORD   .-2
3014                                                            ;FLUSH CACHE TESTS
3015                                                            ;VSIU BIT DID NOT SET AS A RESULT OF FLUSH
3016 017512  000000                     .WORD   0
3017 017514  000240                10$:  NOP                     ;END OF TEST
     017516  005237  001472              INC     $TESTN          ;INCREMENT TEST COUNTER
```

TEST # 122 - CHECK THAT VSIU BIT CLEARS

```
                                        .SBTTL  TEST # 122 - CHECK THAT VSIU BIT CLEARS
                                        ;;*****************************************************************
                                        ;*TEST 122 - CHECK THAT VSIU BIT CLEARS
                                        ;*      VERIFY THAT VSIU BIT WILL CHANGE FROM A SET TO CLEAR CONDITION AS
                                        ;*      A RESULT OF CACHE FLUSH
                                        ;;*****************************************************************  *
     017522
3023 017522  000004                    TST122: SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     017524  017534                             .WORD   40$            ;TEST START LOCATION
     017526  017534                             .WORD   1$             ;LOOP ON ERROR START LOCATION
     017530  000000                             .WORD   0              ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     017532  017600                             .WORD   25$            ;LOOP ON ERROR END LOCATION
     017534                             40$:
3024 017534  032737  020000  177746   1$:     BIT     #VSIU,CCR      ;IS SET B BEING USED
3025 017542  001007                             BNE     3$             ;YES
3026 017544  052737  000400  177746             BIS     #FC,CCR        ;CAUSE FLUSH FOR SET B
3027 017552  032737  010000  177746   200$:   BIT     #VCIP,CCR      ;WAIT FOR FLUSH TO COMPLETE
3028 017560  001374                             BNE     200$
3029 017562  052737  000400  177746   3$:     BIS     #FC,CCR        ;CAUSE FLUSH
3030 017570  032737  010000  177746   4$:     BIT     #VCIP,CCR      ;WAIT FOR FLUSH TO COMPLETE
3031 017576  001374                             BNE     4$
3032 017600  000240                    25$:     NOP                    ;INSTRUCTION 'JMP 1$' PLACED HERE
     017602  000240                             NOP                    ;FOR  LOOP ON ERROR
3033 017604  032737  020000  177746             BIT     #VSIU,CCR      ;IS VSIU BIT =0 INDICATING VALID SET
3034                                                                    ;A WAS SELECTED
3035 017612  001403                             BEQ     10$            ;PASS
3036 017614  104406                             ERROR                  ;ERROR
                                                                        ;-----
     017616  017614                             .WORD   .-2
3037                                                                    ;FLUSH CACHE TESTS
3038                                                                    ;VSIU BIT DID NOT CLEAR AS A RESULT OF FLUSH
3039 017620  000000                             .WORD   0
3040 017622  000240                    10$:     NOP                    ;END OF TEST
     017624  005237  001472                     INC     $TESTN         ;INCREMENT TEST COUNTER
```

```
3046                                    .SBTTL  TEST # 123 - WRITE AND READ 0'S TO ALL LOW CACHE VALID
                                        ;;*****************************************************************
                                        ;*TEST 123 - WRITE AND READ 0'S TO ALL LOW CACHE VALID
                                        ;*      WRITE AND READ 0'S TO ALL LOW CACHE  VALID
                                        ;*      BIT STORE ADDRESS LOCATIONS- SET A
                                        ;*      (VALID STORE LOCATIONS 0000 TO 3777)
                                        ;;*****************************************************************
     017630                             TST123:
3047 017630  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     017632  017642                             .WORD   40$             ;TEST START LOCATION
     017634  070052                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     017636  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     017640  070100                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     017642  012737  001015  177746  40$:      MOV     #OFF,CCR        ;DISABLE CACHE
     017650  004437  002370                    JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     017654  020042                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

3048 017656  032737  020000  177746            BIT     #VSIU,CCR       ;IS SET A BEING USED?
3049 017664  001407                             BEQ     3$              ;YES
3050 017666  052737  000400  177746            BIS     #FC,CCR         ;NO; FLUSH CACHE FOR SET A
3051 017674  032737  010000  177746  200$:     BIT     #VCIP,CCR       ;WAIT TILL FLUSH COMPLETE
3052 017702  001374                             BNE     200$
3053 017704  012737  177777  177752  3$:       MOV     #-1,CHR         ;LOAD AMR<21:0> WITH 1'S VIA CHR AND CMR
3054                                                                    ;REGISTERS, SINCE TDAR WILL BE USED
3055 017712  112737  000374  177751            MOVB    #374,CMR+1
3056 017720  012705  060000                     MOV     #60000,R5       ;;ADDRESS 60000 INTO R5
3057 017724  012703  040000                     MOV     #40000,R3       ;ADDRESS 40000 INTO R3
3058 017730  012737  000015  177746  1$:       MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE VALID STORE
3059 017736  112737  000003  177750            MOVB    #HODO+TDAR,CMR  ;HODO ALLOWS VALID STORE  SET A TO
3060                                                                    ;BE WRITTEN TO CMR<12> ONLY DURING
3061                                                                    ;THE DESTINATION MEMORY ACCESS.
3062                                                                    ;TDAR WILL FORCE A 0 TO BE WRITTEN
3063                                                                    ;INTO VALID STORE WHEN A WRITE TO
3064                                                                    ;VALID STORE OCCURS
3065 017744  005713                             TST     (R3)
3066 017746  005715                             TST     (R5)            ;WRITE A 0 INTO VALID STORE ADDRESS
3067                                                                    ;LOCATION SPECIFIED BY R5'S BITS 12 TO 1.
3068 017750  005715                             TST     (R5)            ;WRITE VALID STORE DATA INTO CMR<12>
3069                                                                    ;FROM VALID STORE ADDRESS LOCATION
3070                                                                    ;JUST WRITTEN INTO.
3071 017752  013701  177750                     MOV     CMR,R1          ;SAVE CMR DATA
3072 017756  000240                    25$:     NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     017760  000240                             NOP                     ;FOR  LOOP ON ERROR
3073 017762  105037  177750                     CLRB    CMR             ;DISABLE MAINT. MODE
3074 017766  012737  001015  177746            MOV     #OFF,CCR        ;DISABLE CACHE
3075 017774  032701  010000                     BIT     #VLD,R1         ;CMR<12> SHOULD BE 0.
3076 020000  001410                             BEQ     9$              ;PASS
3077 020002  010537  047334                     MOV     R5,CA121        ;SAVE VALID STORE ADDRESS LOCATION
3078                                                                    ;USED: CA<12:1>
3079 020006  006237  047334                     ASR     CA121           ;PREPARE CA121 FOR TYPEOUT
3080 020012  104406                             ERROR                   ;ERROR
                                                                        ;-----
     020014  020012                             .WORD   .-2
```

TEST # 123 - WRITE AND READ 0'S TO ALL LOW CACHE VALID

```
3081                                                    ;VALID BITS STORE TESTS
3082                                                    ;READING VALID STORE DATA SET A
3083                                                    ;THRU CMR<12> DID NOT RESULT IN 0.
3084 020016  047334                    CA121            ;PRINT VALID STORE ADDRESS LOCATION
3085                                                    ;USED: CA<12:1>.
3086 020020  000000                    .WORD   0
3087 020022  062705  000002      9$:   ADD     #2,R5     ;NEXT VALID STORE LOCATION
3088 020026  062703  000002            ADD     #2,R3
3089 020032  020527  070000            CMP     R5,#70000 ;HAVE ALL LOW CACHE ADDRESS LOCATIONS BEEN DONE?
3090 020036  001334                    BNE     1$        ;NO
3091 020040  000240              10$:  NOP               ;END OF TEST
     020042  005237  001472            INC     $TESTN    ;INCREMENT TEST COUNTER
```

```
3097                                    .SBTTL  TEST # 124 - WRITE AND READ 1'S TO ALL LOW CACHE VALID
                                        ;;*****************************************************************
                                        ;*TEST 124 - WRITE AND READ 1'S TO ALL LOW CACHE VALID
                                        ;*      WRITE AND READ 1'S TO ALL LOW CACHE  VALID
                                        ;*      BIT STORE ADDRESS LOCATIONS- SET A
                                        ;*      (VALID STORE LOCATIONS 0000 TO 3777)
                                        ;;*****************************************************************
     020046                             TST124:
3098 020046  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     020050  020060                             .WORD   40$             ;TEST START LOCATION
     020052  070036                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     020054  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     020056  070064                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     020060  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     020066  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     020072  020244                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

3099 020074  032737  020000  177746             BIT     #VSIU,CCR       ;IS SET A BEING USED?
3100 020102  001407                             BEQ     3$              ;YES
3101 020104  052737  000400  177746             BIS     #FC,CCR         ;NO; FLUSH CACHE FOR SET A
3102 020112  032737  010000  177746  200$:      BIT     #VCIP,CCR       ;WAIT TILL FLUSH COMPLETE
3103 020120  001374                             BNE     200$
3104 020122  012705  060000             3$:     MOV     #60000,R5       ;;ADDRESS 60000 INTO R5
3105 020126  012703  040000                     MOV     #40000,R3       ;ADDRESS 40000 INTO R3
3106 020132  012737  000015  177746  1$:        MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE VALID STORE
3107 020140  112737  000002  177750             MOVB    #HODO,CMR       ;HODO ALLOWS VALID STORE  SET A TO
3108                                                                    ;BE WRITTEN TO CMR<12> ONLY DURING
3109                                                                    ;THE DESTINATION MEMORY ACCESS.
3110 020146  005713                             TST     (R3)
3111 020150  005715                             TST     (R5)            ;WRITE A 1 INTO VALID STORE ADDRESS
3112                                                                    ;LOCATION SPECIFIED BY R5'S BITS 12 TO 1.
3113 020152  005715                             TST     (R5)            ;WRITE VALID STORE DATA INTO CMR<12>
3114                                                                    ;FROM VALID STORE ADDRESS LOCATION
3115                                                                    ;JUST WRITTEN INTO.
3116 020154  013701  177750                     MOV     CMR,R1          ;SAVE CMR DATA
3117 020160  000240                 25$:        NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     020162  000240                             NOP                     ;FOR  LOOP ON ERROR
3118 020164  105037  177750                     CLRB    CMR             ;DISABLE MAINT. MODE
3119 020170  012737  001015  177746             MOV     #OFF,CCR        ;DISABLE CACHE
3120 020176  032701  010000                     BIT     #VLD,R1         ;CMR<12> SHOULD BE 1.
3121 020202  001010                             BNE     9$              ;PASS
3122
3123 020204  010537  047334                     MOV     R5,CA121        ;SAVE VALID STORE ADDRESS LOCATION
3124                                                                    ;USED: CA<12:1>
3125 020210  006237  047334                     ASR     CA121           ;PREPARE CA121 FOR TYPEOUT
3126 020214  104406                             ERROR                   ;ERROR
                                                                        ;-----
     020216  020214                             .WORD   .-2
3127                                                                    ;VALID BITS STORE TESTS
3128                                                                    ;READING VALID STORE DATA SET A
3129                                                                    ;THRU CMR<12> DID NOT RESULT IN 1.
3130 020220  047334                             CA121                   ;PRINT VALID STORE ADDRESS LOCATION
3131                                                                    ;USED: CA<12:1>.
```

TEST # 124 - WRITE AND READ 1'S TO ALL LOW CACHE VALID

```
 3132 020222  000000                        .WORD   0
 3133 020224  062705  000002          9$:   ADD     #2,R5           ;NEXT VALID STORE LOCATION
 3134 020230  062703  000002                ADD     #2,R3
 3135 020234  020527  070000                CMP     R5,#70000       ;HAVE ALL LOW CACHE ADDRESS LOCATIONS BEEN DONE?
 3136 020240  001334                        BNE     1$              ;NO
 3137 020242  000240                 10$:   NOP                     ;END OF TEST
      020244  005237  001472                INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
3143                                    .SBTTL  TEST # 125 - WRITE AND READ 0'S TO ALL HIGH CACHE VALID
                                        ;;*****************************************************************
                                        ;*TEST 125 - WRITE AND READ 0'S TO ALL HIGH CACHE VALID
                                        ;*      WRITE AND READ 0'S TO ALL HIGH CACHE  VALID
                                        ;*      BIT STORE ADDRESS LOCATIONS- SET A
                                        ;*      (VALID STORE LOCATIONS 4000 TO 7777)
                                        ;;*****************************************************************
     020250                             TST125:
3144 020250  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     020252  020262                             .WORD   40$             ;TEST START LOCATION
     020254  060052                             .WORD   1$-40$+57764    ;LOOP ON ERROR START LOCATION
     020256  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     020260  060100                             .WORD   25$-40$+57764   ;LOOP ON ERROR END LOCATION
     020262  012737  001015  177746  40$:      MOV     #OFF,CCR        ;DISABLE CACHE
     020270  004437  002342                    JSR     R4,RELCTL       ;LOCATE TEST CODE TO LOW CACHE SPACE
     020274  020462                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO LOW CACHE SPACE

3145 020276  032737  020000  177746            BIT     #VSIU,CCR       ;IS SET A BEING USED?
3146 020304  001407                             BEQ     3$              ;YES
3147 020306  052737  000400  177746            BIS     #FC,CCR         ;NO; FLUSH CACHE FOR SET A
3148 020314  032737  010000  177746  200$:     BIT     #VCIP,CCR       ;WAIT TILL FLUSH COMPLETE
3149 020322  001374                             BNE     200$
3150 020324  012737  177777  177752  3$:       MOV     #-1,CHR         ;LOAD AMR<21:0> WITH 1'S VIA CHR AND CMR
3151                                                                    ;REGISTERS, SINCE TDAR WILL BE USED
3152 020332  112737  000374  177751            MOVB    #374,CMR+1
3153 020340  012705  070000                     MOV     #70000,R5       ;;ADDRESS 70000 INTO R5
3154 020344  012703  050000                     MOV     #50000,R3       ;ADDRESS 50000 INTO R3
3155 020350  012737  000015  177746  1$:       MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE VALID STORE
3156 020356  112737  000003  177750            MOVB    #HODO+TDAR,CMR  ;HODO ALLOWS VALID STORE  SET A TO
3157                                                                    ;BE WRITTEN TO CMR<12> ONLY DURING
3158                                                                    ;THE DESTINATION MEMORY ACCESS.
3159                                                                    ;TDAR WILL FORCE A 0 TO BE WRITTEN
3160                                                                    ;INTO VALID STORE WHEN A WRITE TO
3161                                                                    ;VALID STORE OCCURS
3162 020364  005713                             TST     (R3)
3163 020366  005715                             TST     (R5)            ;WRITE A 0 INTO VALID STORE ADDRESS
3164                                                                    ;LOCATION SPECIFIED BY R5'S BITS 12 TO 1.
3165 020370  005715                             TST     (R5)            ;WRITE VALID STORE DATA INTO CMR<12>
3166                                                                    ;FROM VALID STORE ADDRESS LOCATION
3167                                                                    ;JUST WRITTEN INTO.
3168 020372  013701  177750                     MOV     CMR,R1          ;SAVE CMR DATA
3169 020376  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     020400  000240                             NOP                     ;FOR  LOOP ON ERROR
3170 020402  105037  177750                     CLRB    CMR             ;DISABLE MAINT. MODE
3171 020406  012737  001015  177746            MOV     #OFF,CCR        ;DISABLE CACHE
3172 020414  032701  010000                     BIT     #VLD,R1         ;CMR<12> SHOULD BE 0.
3173 020420  001410                             BEQ     9$              ;PASS
3174 020422  010537  047334                     MOV     R5,CA121        ;SAVE VALID STORE ADDRESS LOCATION
3175                                                                    ;USED: CA<12:1>
3176 020426  006237  047334                     ASR     CA121           ;PREPARE CA121 FOR TYPEOUT
3177 020432  104406                             ERROR                   ;ERROR
                                                                        ;-----
     020434  020432                             .WORD   .-2
```

TEST # 125 - WRITE AND READ 0'S TO ALL HIGH CACHE VALID

```
3178                                                            ;VALID BITS STORE TESTS
3179                                                            ;READING VALID STORE DATA SET A
3180                                                            ;THRU CMR<12> DID NOT RESULT IN 0.
3181 020436  047334                    CA121                   ;PRINT VALID STORE ADDRESS LOCATION
3182                                                            ;USED: CA<12:1>.
3183 020440  000000                    .WORD   0
3184 020442  062705  000002    9$:     ADD     #2,R5           ;NEXT VALID STORE LOCATION
3185 020446  062703  000002            ADD     #2,R3
3186 020452  020527  100000            CMP     R5,#100000      ;HAVE ALL HIGH CACHE ADDRESS LOCATIONS BEEN DONE?
3187 020456  001334                    BNE     1$              ;NO
3188 020460  000240            10$:    NOP                     ;END OF TEST
     020462  005237  001472            INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
TEST # 126 - WRITE AND READ 1'S TO ALL HIGH CACHE VALID
   3194                                 .SBTTL  TEST # 126 - WRITE AND READ 1'S TO ALL HIGH CACHE VALID
                                        ;;*****************************************************************
                                        ;*TEST 126 - WRITE AND READ 1'S TO ALL HIGH CACHE VALID
                                        ;*      WRITE AND READ 1'S TO ALL HIGH CACHE  VALID
                                        ;*      BIT STORE ADDRESS LOCATIONS- SET A
                                        ;*      (VALID STORE LOCATIONS 4000 TO 7777)
                                        ;;*****************************************************************
        020466                          TST126:
   3195 020466  000004                          SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
        020470  020500                  .WORD   40$                     ;TEST START LOCATION
        020472  060036                  .WORD   1$-40$+57764            ;LOOP ON ERROR START LOCATION
        020474  000000                  .WORD   0                       ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
        020476  060064                  .WORD   25$-40$+57764           ;LOOP ON ERROR END LOCATION
        020500  012737  001015  177746  40$:    MOV     #OFF,CCR        ;DISABLE CACHE
        020506  004437  002342          JSR     R4,RELCTL               ;LOCATE TEST CODE TO LOW CACHE SPACE
        020512  020664                  .WORD   10$+2                   ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO LOW CACHE SPACE

   3196 020514  032737  020000  177746          BIT     #VSIU,CCR       ;IS SET A BEING USED?
   3197 020522  001407                  BEQ     3$                      ;YES
   3198 020524  052737  000400  177746  BIS     #FC,CCR                 ;NO; FLUSH CACHE FOR SET A
   3199 020532  032737  010000  177746  200$:   BIT     #VCIP,CCR       ;WAIT TILL FLUSH COMPLETE
   3200 020540  001374                  BNE     200$
   3201 020542  012705  070000          3$:     MOV     #70000,R5       ;;ADDRESS 70000 INTO R5
   3202 020546  012703  050000          MOV     #50000,R3               ;ADDRESS 50000 INTO R3
   3203 020552  012737  000015  177746  1$:     MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE VALID STORE
   3204 020560  112737  000002  177750          MOVB    #HODO,CMR       ;HODO ALLOWS VALID STORE  SET A TO
   3205                                                                 ;BE WRITTEN TO CMR<12> ONLY DURING
   3206                                                                 ;THE DESTINATION MEMORY ACCESS.
   3207 020566  005713                  TST     (R3)
   3208 020570  005715                  TST     (R5)                    ;WRITE A 1 INTO VALID STORE ADDRESS
   3209                                                                 ;LOCATION SPECIFIED BY R5'S BITS 12 TO 1.
   3210 020572  005715                  TST     (R5)                    ;WRITE VALID STORE DATA INTO CMR<12>
   3211                                                                 ;FROM VALID STORE ADDRESS LOCATION
   3212                                                                 ;JUST WRITTEN INTO.
   3213 020574  013701  177750          MOV     CMR,R1                  ;SAVE CMR DATA
   3214 020600  000240          25$:    NOP                             ;INSTRUCTION 'JMP 1$' PLACED HERE
        020602  000240                  NOP                             ;FOR  LOOP ON ERROR
   3215 020604  105037  177750          CLRB    CMR                     ;DISABLE MAINT. MODE
   3216 020610  012737  001015  177746  MOV     #OFF,CCR                ;DISABLE CACHE
   3217 020616  032701  010000          BIT     #VLD,R1                 ;CMR<12> SHOULD BE 1.
   3218 020622  001010                  BNE     9$                      ;PASS
   3219 020624  010537  047334          MOV     R5,CA121                ;SAVE VALID STORE ADDRESS LOCATION
   3220                                                                 ;USED: CA<12:1>
   3221 020630  006237  047334          ASR     CA121                   ;PREPARE CA121 FOR TYPEOUT
   3222 020634  104406                  ERROR                           ;ERROR
                                                                        ;-----
        020636  020634                  .WORD   .-2
   3223                                                                 ;VALID BITS STORE TESTS
   3224                                                                 ;READING VALID STORE DATA SET A
   3225                                                                 ;THRU CMR<12> DID NOT RESULT IN 0.
   3226 020640  047334                  CA121                           ;PRINT VALID STORE ADDRESS LOCATION
   3227                                                                 ;USED: CA<12:1>.
   3228 020642  000000                  .WORD   0
```

TEST # 126 - WRITE AND READ 1'S TO ALL HIGH CACHE VALID

```
3229 020644  062705  000002          9$:     ADD     #2,R5           ;NEXT VALID STORE LOCATION
3230 020650  062703  000002                  ADD     #2,R3
3231 020654  020527  100000                  CMP     R5,#100000      ;HAVE ALL HIGH CACHE ADDRESS LOCATIONS BEEN DONE?
3232 020660  001334                          BNE     1$              ;NO
3233 020662  000240                  10$:    NOP                     ;END OF TEST
     020664  005237  001472                  INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
3237                                    .SBTTL  TEST # 127 - VERIFY VALID DATA STORE ADRS LINES (CA(12:1))
                                        ;;*****************************************************************
                                        ;*TEST 127 - VERIFY VALID DATA STORE ADRS LINES (CA(12:1))
                                        ;*       VERIFY VALID DATA STORE ADDRESS LINES (CA<12:1>)
                                        ;;*****************************************************************
     020670                             TST127:
3238 020670  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     020672  020702                             .WORD   40$             ;TEST START LOCATION
     020674  070054                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     020676  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     020700  070130                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     020702  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     020710  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     020714  021132                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

3239 020716  032737  020000  177746             BIT     #VSIU,CCR       ;IS SET A BEING USED?
3240 020724  001407                             BEQ     3$              ;YES
3241 020726  052737  000400  177746             BIS     #FC,CCR         ;NO; FLUSH CACHE FOR SET A
3242 020734  032737  010000  177746  4$:        BIT     #VCIP,CCR       ;WAIT TILL FLUSH COMPLETE
3243 020742  001374                             BNE     4$
3244 020744  012737  000002  047344  3$:        MOV     #2,FLTPAT       ;1ST FLOATING CACHE DATA STORE ADDRESS PATTERN
3245 020752  012702  040000        2$:        MOV     #40000,R2       ;
3246 020756  012703  060000                     MOV     #60000,R3       ;
3247 020762  063702  047344                     ADD     FLTPAT,R2       ;R2 CONTAINS 40000+FLTPAT
3248 020766  063703  047344                     ADD     FLTPAT,R3       ;R3 CONTAINS 60000+FLTPAT
3249 020772  112737  000002  177750  1$:        MOVB    #HODO,CMR       ;HODO ALLOWS VALID DATA STORE BITS TO BE
3250                                                                    ;WRITTEN TO CMR<12> ONLY DURING THE
3251                                                                    ;DESTINATION MEMORY ACCESS OF AN INSTRUCTION.
3252 021000  012737  000015  177746             MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE VALID STORE
3253 021006  152737  000001  177750             BISB    #TDAR,CMR       ;TDAR WILL FORCE A 0 TO BE WRITTEN
3254                                                                    ;INTO VALID STORE WHEN A WRITE TO
3255                                                                    ;VALID STORE OCCURS.
3256 021014  005737  040000                     TST     40000
3257 021020  005737  060000                     TST     60000           ;WRITE 0 INTO VALID STORE LOCATION 0000.
3258 021024  142737  000001  177750             BICB    #TDAR,CMR       ;CLEARING TDAR WILL ALLOW A 1 TO BE
3259                                                                    ;WRITTEN INTO VALID STORE WHEN A WRITE
3260                                                                    ;TO VALID STORE OCCURS.
3261 021032  005712                             TST     (R2)
3262 021034  005713                             TST     (R3)            ;WRITE 1 INTO VALID STORE LOCATION
3263                                                                    ;SPECIFIED BY R3'S BITS 1 THRU 12:CA<12:1>.
3264 021036  005737  060000                     TST     60000           ;LOAD DATA FROM VALID DATA STORE LOCATION
3265                                                                    ;0000 INTO CMR<12>.
3266 021042  013701  177750                     MOV     CMR,R1          ;SAVE CMR DATA
3267 021046  000240                25$:        NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     021050  000240                             NOP                     ;FOR  LOOP ON ERROR
3268 021052  105037  177750                     CLRB    CMR             ;DISABLE MAINT. MODE
3269 021056  012737  001015  177746             MOV     #OFF,CCR        ;DISABLE CACHE
3270 021064  032701  010000                     BIT     #VLD,R1         ;CMR<12> SHOULD READ 0.
3271 021070  001411                             BEQ     9$              ;PASS
3272                                                            ;ROUTINE
3273 021072  013737  047344  047334             MOV     FLTPAT,CA121    ;SAVE CA<12:1> USED
3274 021100  006237  047334                     ASR     CA121           ;PREPARE CA121 FOR TYPEOUT
3275 021104  104406                             ERROR                   ;ERROR
```

```
                                                                        ;-----
      021106  021104                          .WORD   .-2
 3276                                                                   ;VALID STOR ADDRESS VERIFICATION.
 3277                                                                   ;VALID STORE LOCATION 0000 DID NOT
 3278                                                                   ;READ AS A 0 INDICATING THAT IT WAS
 3279                                                                   ;OVERWRITTEN WITH A 1. THIS SUGGESTS
 3280                                                                   ;A BAD CA<12:1> VALID STORE ADDRESS LINE.
 3281 021110  047334                          CA121                   ;PRINT VALID STORE ADDRESS FAILURE: CA<12:1>.
 3282                                                                   ;NOTE THAT THE 1 IN THIS PATTERN
 3283                                                                   ;WILL POINT TO THE ADDRESS LINE OF
 3284                                                                   ;THAT BROUGHT OUT ERROR.
 3285 021112  000000                          .WORD   0
 3286 021114  006337  047344          9$:     ASL     FLTPAT          ;NEXT PATTERN
 3287 021120  022737  020000  047344          CMP     #20000,FLTPAT   ;HAS VALID DATA STORE  ADDRESS 4000 BEEN DONE?
 3288 021126  001311                          BNE     2$              ;NO
 3289 021130  000240                  10$:    NOP                     ;END OF TEST
      021132  005237  001472                  INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
3295                                    .SBTTL  TEST # 130 - LOW CACHE INVALIDATE WITH CACHE FLUSH
                                        ;;*****************************************************************
                                        ;*TEST 130 - LOW CACHE INVALIDATE WITH CACHE FLUSH
                                        ;*      VERIFY THAT ALL LOW CACHE VALID STORE SET A ADDRESS LOCATIONS
                                        ;*      WILL BE INVALIDATED AS A RESULT OF A CACHE FLUSH.
                                        ;*      (FLUSH COUNTER ADDRESS LOCATIONS [CNT<12:1>]: 0000-3777)
                                        ;;*****************************************************************
     021136                             TST130:
3296 021136  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     021140  021150                             .WORD   40$             ;TEST START LOCATION
     021142  070074                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     021144  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     021146  070130                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     021150  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     021156  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     021162  021410                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

3297 021164  012705  060000                     MOV     #60000,R5       ;;ADDRESS 60000 INTO R5
3298 021170  012703  040000                     MOV     #40000,R3       ;ADDRESS 40000 INTO R3
3299 021174  032737  020000  177746             BIT     #VSIU,CCR       ;IS SET A BEING USED?
3300 021202  001407                             BEQ     3$              ;YES
3301 021204  052737  000400  177746             BIS     #FC,CCR         ;NO; FLUSH CACHE FOR SET A
3302 021212  032737  010000  177746  200$:      BIT     #VCIP,CCR       ;WAIT TILL FLUSH COMPLETE
3303 021220  001374                             BNE     200$
3304 021222  012737  000015  177746  3$:        MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE VALID STORE
3305 021230  112737  000002  177750             MOVB    #HODO,CMR       ;HODO ALLOWS VALID STORE  SET A TO
3306                                                                    ;BE WRITTEN TO CMR<12> ONLY DURING
3307                                                                    ;THE DESTINATION MEMORY ACCESS.
3308 021236  005713                     4$:     TST     (R3)
3309 021240  005715                             TST     (R5)            ;WRITE A 1 INTO VALID STORE ADDRESS
3310                                                                    ;LOCATION SPECIFIED BY R5'S BITS 12 TO 1.
3311 021242  062705  000002                     ADD     #2,R5           ;NEXT VALID STORE LOCATION
3312 021246  062703  000002                     ADD     #2,R3
3313 021252  020527  070000                     CMP     R5,#70000       ;HAVE ALL LOW CACHE LOCATIONS BEEN DONE?
3314 021256  001367                             BNE     4$              ;NO
3315 021260  052737  000400  177746  1$:        BIS     #FC,CCR         ;FLUSH CACHE TO SELECT SET B AND
3316                                                                    ;INVALIDATE SET A
3317 021266  032737  010000  177746  500$:      BIT     #VCIP,CCR       ;WAIT TILL FLUSH COMPLETE
3318 021274  001374                             BNE     500$
3319 021276  052737  000400  177746             BIS     #FC,CCR         ;FLUSH TO SELECT SET A AGAIN
3320 021304  032737  010000  177746  6$:        BIT     #VCIP,CCR       ;WAIT
3321 021312  001374                             BNE     6$
3322 021314  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     021316  000240                             NOP                     ;FOR  LOOP ON ERROR
3323 021320  012705  060000                     MOV     #60000,R5       ;ADDRESS 60000 INTO R5
3324 021324  005715                     2$:     TST     (R5)            ;WRITE VALID STORE DATA INTO CMR<12>
3325                                                                    ;FROM ADDRESS LOCATION SPECIFIED BY
3326                                                                    ;R5'S BITS 12-1.
3327 021326  013701  177750                     MOV     CMR,R1          ;SAVE CMR DATA
3328 021332  032701  010000                     BIT     #VLD,R1         ;CMR<12> SHOULD BE 0
3329 021336  001416                             BEQ     9$              ;PASS
3330 021340  105037  177750                     CLRB    CMR             ;DISABLE MAINT. MODE
3331 021344  012737  001015  177746             MOV     #OFF,CCR        ;DISABLE CACHE
```

TEST # 130 - LOW CACHE INVALIDATE WITH CACHE FLUSH

```
3332 021352  010537  047342              MOV     R5,CNT121       ;SAVE VALID STORE FLUSH ADDRESS LOCATION
3333                                                             ;USED: CNT<12:1>
3334 021356  006237  047342              ASR     CNT121          ;PREPARE CNT121 FOR TYPEOUT
3335 021362  104406                      ERROR                   ;ERROR
                                                                 ;-----
     021364  021362                      .WORD   .-2
3336                                                             ;FLUSH CACHE INVALID TEST-SET A
3337                                                             ;READING VALID STORE LOCATION FROM SET A THRU CMR<12>
3338                                                             ;DID NOT RESULT IN A ZERO,INDICATING THAT
3339                                                             ;THE CACHE FLUSH DID NOT INVALIDATE THIS
3340                                                             ; LOCATION.
3341 021366  047342                      CNT121                  ;PRINT VALID STORE FLUSH ADDRESS LOCATION
3342                                                             ;IN ERROR: CNT<12:1>.
3343 021370  000000                      .WORD   0
3344 021372  000405                      BR      10$             ;IF ERROR, END TEST
3345 021374  062705  000002      9$:     ADD     #2,R5           ;NEXT VALID STORE LOCATION
3346 021400  020527  070000              CMP     R5,#70000       ;HAVE ALL LOW CACHE ADDRESS LOCATIONS BEEN DONE?
3347 021404  001347                      BNE     2$              ;NO
3348 021406  000240              10$:    NOP                     ;END OF TEST
     021410  005237  001472              INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
3354                                    .SBTTL  TEST # 131 - HIGH CACHE INVALIDATE WITH CACHE FLUSH
                                        ;;*****************************************************************
                                        ;*TEST 131 - HIGH CACHE INVALIDATE WITH CACHE FLUSH
                                        ;*      VERIFY THAT ALL HI CACHE VALID STORE SET A ADDRESS LOCATIONS
                                        ;*      WILL BE INVALIDATED AS A RESULT OF A CACHE FLUSH.
                                        ;*      (FLUSH COUNTER ADDRESS LOCATIONS [CNT<12:1>]: 4000-7777)
                                        ;;*****************************************************************
     021414                             TST131:
3355 021414  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     021416  021426                             .WORD   40$             ;TEST START LOCATION
     021420  060074                             .WORD   1$-40$+57764    ;LOOP ON ERROR START LOCATION
     021422  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     021424  060130                             .WORD   25$-40$+57764   ;LOOP ON ERROR END LOCATION
     021426  012737  001015  177746  40$:      MOV     #OFF,CCR        ;DISABLE CACHE
     021434  004437  002342                    JSR     R4,RELCTL       ;LOCATE TEST CODE TO LOW CACHE SPACE
     021440  021666                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO LOW CACHE SPACE

3356 021442  012705  070000                     MOV     #70000,R5       ;;ADDRESS 70000 INTO R5
3357 021446  012703  050000                     MOV     #50000,R3       ;ADDRESS 50000 INTO R3
3358 021452  032737  020000  177746             BIT     #VSIU,CCR       ;IS SET A BEING USED?
3359 021460  001407                            BEQ     3$              ;YES
3360 021462  052737  000400  177746             BIS     #FC,CCR         ;NO; FLUSH CACHE FOR SET A
3361 021470  032737  010000  177746  200$:     BIT     #VCIP,CCR       ;WAIT TILL FLUSH COMPLETE
3362 021476  001374                            BNE     200$
3363 021500  012737  000015  177746  3$:       MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE VALID STORE
3364 021506  112737  000002  177750            MOVB    #HODO,CMR       ;HODO ALLOWS VALID STORE  SET A TO
3365                                                                    ;BE WRITTEN TO CMR<12> ONLY DURING
3366                                                                    ;THE DESTINATION MEMORY ACCESS.
3367 021514  005713                    4$:     TST     (R3)
3368 021516  005715                            TST     (R5)            ;WRITE A 1 INTO VALID STORE ADDRESS
3369                                                                    ;LOCATION SPECIFIED BY R5'S BITS 12 TO 1.
3370 021520  062705  000002                     ADD     #2,R5           ;NEXT VALID STORE LOCATION
3371 021524  062703  000002                     ADD     #2,R3
3372 021530  020527  100000                     CMP     R5,#100000      ;HAVE ALL HI CACHE LOCATIONS BEEN DONE?
3373 021534  001367                            BNE     4$              ;NO
3374 021536  052737  000400  177746  1$:       BIS     #FC,CCR         ;FLUSH CACHE TO SELECT SET B AND
3375                                                                    ;INVALIDATE SET A
3376 021544  032737  010000  177746  500$:     BIT     #VCIP,CCR       ;WAIT TILL FLUSH COMPLETE
3377 021552  001374                            BNE     500$
3378 021554  052737  000400  177746             BIS     #FC,CCR         ;FLUSH TO SELECT SET A AGAIN
3379 021562  032737  010000  177746  6$:       BIT     #VCIP,CCR       ;WAIT
3380 021570  001374                            BNE     6$
3381 021572  000240                    25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     021574  000240                            NOP                     ;FOR  LOOP ON ERROR
3382 021576  012705  070000                     MOV     #70000,R5       ;ADDRESS 70000 INTO R5
3383 021602  005715                    2$:     TST     (R5)            ;WRITE VALID STORE DATA INTO CMR<12>
3384                                                                    ;FROM ADDRESS LOCATION SPECIFIED BY
3385                                                                    ;R5'S BITS 12-1.
3386 021604  013701  177750                     MOV     CMR,R1          ;SAVE CMR DATA
3387 021610  032701  010000                     BIT     #VLD,R1         ;CMR<12> SHOULD BE 0
3388 021614  001416                            BEQ     9$              ;PASS
3389 021616  105037  177750                     CLRB    CMR             ;DISABLE MAINT. MODE
3390 021622  012737  001015  177746             MOV     #OFF,CCR        ;DISABLE CACHE
```

TEST # 131 - HIGH CACHE INVALIDATE WITH CACHE FLUSH

```
3391 021630  010537  047342                MOV     R5,CNT121       ;SAVE VALID STORE FLUSH ADDRESS LOCATION
3392                                                                 ;USED: CNT<12:1>
3393 021634  006237  047342                ASR     CNT121          ;PREPARE CNT121 FOR TYPEOUT
3394 021640  104406                        ERROR                   ;ERROR
                                                                     ;-----
     021642  021640                        .WORD   .-2
3395                                                                 ;FLUSH CACHE TEST-SET A
3396                                                                 ;READING VALID STORE LOCATION FROM SET A THRU CMR<12>
3397                                                                 ;DID NOT RESULT IN A ZERO,INDICATING THAT
3398                                                                 ;THE CACHE FLUSH DID NOT INVALIDATE THIS
3399                                                                 ; LOCATION.
3400 021644  047342                        CNT121                  ;PRINT VALID STORE FLUSH ADDRESS LOCATION
3401                                                                 ;IN ERROR: CNT<12:1>.
3402 021646  000000                        .WORD   0
3403 021650  000405                        BR      10$             ;IF ERROR, END TEST
3404 021652  062705  000002          9$:   ADD     #2,R5           ;NEXT VALID STORE LOCATION
3405 021656  020527  100000                CMP     R5,#100000      ;HAVE ALL HI CACHE ADDRESS LOCATIONS BEEN DONE?
3406 021662  001347                        BNE     2$              ;NO
3407 021664  000240                10$:   NOP                     ;END OF TEST
     021666  005237  001472                INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 132 - WRITE AND READ 0'S TO ALL LOW CACHE VALID
                                ;;*****************************************************************
                                ;*TEST 132 - WRITE AND READ 0'S TO ALL LOW CACHE VALID
                                ;*      WRITE AND READ 0'S TO ALL LOW CACHE  VALID
                                ;*      BIT STORE ADDRESS LOCATIONS- SET B
                                ;*      (VALID STORE LOCATIONS 0000 TO 3777)
                                ;;*****************************************************************
     021672                     TST132:
3414 021672  000004                        SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                   ;ERROR/LOOP ON TEST
     021674  021704                        .WORD   40$             ;TEST START LOCATION
     021676  070052                        .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     021700  000000                        .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     021702  070100                        .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     021704  012737  001015  177746  40$:   MOV     #OFF,CCR        ;DISABLE CACHE
     021712  004437  002370                JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     021716  022104                        .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO HI CACHE SPACE

3415 021720  032737  020000  177746        BIT     #VSIU,CCR       ;IS SET B BEING USED?
3416 021726  001007                        BNE     3$              ;YES
3417 021730  052737  000400  177746        BIS     #FC,CCR         ;NO; FLUSH CACHE FOR SET B
3418 021736  032737  010000  177746  200$: BIT     #VCIP,CCR       ;WAIT TILL FLUSH COMPLETE
3419 021744  001374                        BNE     200$
3420 021746  012737  177777  177752  3$:   MOV     #-1,CHR         ;LOAD AMR<21:0> WITH 1'S VIA CHR AND CMR
3421                                                               ;REGISTERS, SINCE TDAR WILL BE USED
3422 021754  112737  000374  177751        MOVB    #374,CMR+1
3423 021762  012705  060000                MOV     #60000,R5       ;;ADDRESS 60000 INTO R5
3424 021766  012703  040000                MOV     #40000,R3       ;ADDRESS 40000 INTO R3
3425 021772  012737  000015  177746  1$:   MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE VALID STORE
3426 022000  112737  000003  177750        MOVB    #HODO+TDAR,CMR  ;HODO ALLOWS VALID STORE  SET B TO
3427                                                               ;BE WRITTEN TO CMR<12> ONLY DURING
3428                                                               ;THE DESTINATION MEMORY ACCESS.
3429                                                               ;TDAR WILL FORCE A 0 TO BE WRITTEN
3430                                                               ;INTO VALID STORE WHEN A WRITE TO
3431                                                               ;VALID STORE OCCURS
3432 022006  005713                        TST     (R3)
3433 022010  005715                        TST     (R5)            ;WRITE A 0 INTO VALID STORE ADDRESS
3434                                                               ;LOCATION SPECIFIED BY R5'S BITS 12 TO 1.
3435 022012  005715                        TST     (R5)            ;WRITE VALID STORE DATA INTO CMR<12>
3436                                                               ;FROM VALID STORE ADDRESS LOCATION
3437                                                               ;JUST WRITTEN INTO.
3438 022014  013701  177750                MOV     CMR,R1          ;SAVE CMR DATA
3439 022020  000240                  25$:  NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     022022  000240                        NOP                     ;FOR  LOOP ON ERROR
3440 022024  105037  177750                CLRB    CMR             ;DISABLE MAINT. MODE
3441 022030  012737  001015  177746        MOV     #OFF,CCR        ;DISABLE CACHE
3442 022036  032701  010000                BIT     #VLD,R1         ;CMR<12> SHOULD BE 0.
3443 022042  001410                        BEQ     9$              ;PASS
3444 022044  010537  047334                MOV     R5,CA121        ;SAVE VALID STORE ADDRESS LOCATION
3445                                                               ;USED: CA<12:1>
3446 022050  006237  047334                ASR     CA121           ;PREPARE CA121 FOR TYPEOUT
3447 022054  104406                        ERROR                   ;ERROR
                                                                   ;-----
     022056  022054                        .WORD   .-2
```

TEST # 132 - WRITE AND READ 0'S TO ALL LOW CACHE VALID

```
3448                                                            ;VALID BITS STORE TESTS-SET B
3449                                                            ;READING VALID STORE DATA SET B
3450                                                            ;THRU CMR<12> DID NOT RESULT IN 0.
3451 022060  047334                    CA121                   ;PRINT VALID STORE ADDRESS LOCATION
3452                                                            ;USED: CA<12:1>.
3453 022062  000000                    .WORD   0
3454 022064  062705  000002    9$:     ADD     #2,R5           ;NEXT VALID STORE LOCATION
3455 022070  062703  000002            ADD     #2,R3
3456 022074  020527  070000            CMP     R5,#70000       ;HAVE ALL LOW CACHE ADDRESS LOCATIONS BEEN DONE?
3457 022100  001334                    BNE     1$              ;NO
3458 022102  000240            10$:    NOP                     ;END OF TEST
     022104  005237  001472            INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
3464                                    .SBTTL  TEST # 133 - WRITE AND READ 1'S TO ALL LOW CACHE VALID
                                        ;;*****************************************************************
                                        ;*TEST 133 - WRITE AND READ 1'S TO ALL LOW CACHE VALID
                                        ;*      WRITE AND READ 1'S TO ALL LOW CACHE  VALID
                                        ;*      BIT STORE ADDRESS LOCATIONS- SET B
                                        ;*      (VALID STORE LOCATIONS 0000 TO 3777)
                                        ;;*****************************************************************
     022110                             TST133:
3465 022110  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     022112  022122                             .WORD   40$             ;TEST START LOCATION
     022114  070036                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     022116  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     022120  070064                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     022122  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     022130  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     022134  022306                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

3466 022136  032737  020000  177746            BIT     #VSIU,CCR       ;IS SET B BEING USED?
3467 022144  001007                             BNE     3$              ;YES
3468 022146  052737  000400  177746            BIS     #FC,CCR         ;NO; FLUSH CACHE FOR SET B
3469 022154  032737  010000  177746  200$:     BIT     #VCIP,CCR       ;WAIT TILL FLUSH COMPLETE
3470 022162  001374                             BNE     200$
3471 022164  012705  060000            3$:     MOV     #60000,R5       ;;ADDRESS 60000 INTO R5
3472 022170  012703  040000                     MOV     #40000,R3       ;ADDRESS 40000 INTO R3
3473 022174  012737  000015  177746  1$:       MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE VALID STORE
3474 022202  112737  000002  177750            MOVB    #HODO,CMR       ;HODO ALLOWS VALID STORE  SET B TO
3475                                                                    ;BE WRITTEN TO CMR<12> ONLY DURING
3476                                                                    ;THE DESTINATION MEMORY ACCESS.
3477 022210  005713                             TST     (R3)
3478 022212  005715                             TST     (R5)            ;WRITE A 1 INTO VALID STORE ADDRESS
3479                                                                    ;LOCATION SPECIFIED BY R5'S BITS 12 TO 1.
3480 022214  005715                             TST     (R5)            ;WRITE VALID STORE DATA INTO CMR<12>
3481                                                                    ;FROM VALID STORE ADDRESS LOCATION
3482                                                                    ;JUST WRITTEN INTO.
3483 022216  013701  177750                     MOV     CMR,R1          ;SAVE CMR DATA
3484 022222  000240            25$:     NOP                             ;INSTRUCTION 'JMP 1$' PLACED HERE
     022224  000240                     NOP                             ;FOR  LOOP ON ERROR
3485 022226  105037  177750                     CLRB    CMR             ;DISABLE MAINT. MODE
3486 022232  012737  001015  177746            MOV     #OFF,CCR        ;DISABLE CACHE
3487 022240  032701  010000                     BIT     #VLD,R1         ;CMR<12> SHOULD BE 1.
3488 022244  001010                             BNE     9$              ;PASS
3489
3490 022246  010537  047334                     MOV     R5,CA121        ;SAVE VALID STORE ADDRESS LOCATION
3491                                                                    ;USED: CA<12:1>
3492 022252  006237  047334                     ASR     CA121           ;PREPARE CA121 FOR TYPEOUT
3493 022256  104406                             ERROR                   ;ERROR
                                                                        ;-----
     022260  022256                             .WORD   .-2
3494                                                                    ;VALID BITS STORE TESTS - SET B
3495                                                                    ;READING VALID STORE DATA SET B
3496                                                                    ;THRU CMR<12> DID NOT RESULT IN 1.
3497 022262  047334                     CA121                          ;PRINT VALID STORE ADDRESS LOCATION
3498                                                                    ;USED: CA<12:1>.
```

TEST # 133 - WRITE AND READ 1'S TO ALL LOW CACHE VALID

```
 3499 022264  000000                        .WORD   0
 3500 022266  062705  000002        9$:     ADD     #2,R5           ;NEXT VALID STORE LOCATION
 3501 022272  062703  000002                ADD     #2,R3
 3502 022276  020527  070000                CMP     R5,#70000       ;HAVE ALL LOW CACHE ADDRESS LOCATIONS BEEN DONE?
 3503 022302  001334                        BNE     1$              ;NO
 3504 022304  000240        10$:            NOP                     ;END OF TEST
      022306  005237  001472                INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                        .SBTTL  TEST # 134 - WRITE AND READ 0'S TO ALL HIGH CACHE VALID
                                        ;;*****************************************************************
                                        ;*TEST 134 - WRITE AND READ 0'S TO ALL HIGH CACHE VALID
                                        ;*      WRITE AND READ 0'S TO ALL HIGH CACHE  VALID
                                        ;*      BIT STORE ADDRESS LOCATIONS- SET B
                                        ;*      (VALID STORE LOCATIONS 4000 TO 7777)
                                        ;*****************************************************************
     022312                             TST134:
3511 022312  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     022314  022324                             .WORD   40$             ;TEST START LOCATION
     022316  060052                             .WORD   1$-40$+57764    ;LOOP ON ERROR START LOCATION
     022320  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     022322  060100                             .WORD   25$-40$+57764   ;LOOP ON ERROR END LOCATION
     022324  012737  001015  177746  40$:      MOV     #OFF,CCR        ;DISABLE CACHE
     022332  004437  002342                     JSR     R4,RELCTL       ;LOCATE TEST CODE TO LOW CACHE SPACE
     022336  022524                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO LOW CACHE SPACE

3512 022340  032737  020000  177746             BIT     #VSIU,CCR       ;IS SET B BEING USED?
3513 022346  001007                             BNE     3$              ;YES
3514 022350  052737  000400  177746             BIS     #FC,CCR         ;NO; FLUSH CACHE FOR SET B
3515 022356  032737  010000  177746  200$:      BIT     #VCIP,CCR       ;WAIT TILL FLUSH COMPLETE
3516 022364  001374                             BNE     200$
3517 022366  012737  177777  177752  3$:       MOV     #-1,CHR         ;LOAD AMR<21:0> WITH 1'S VIA CHR AND CMR
3518                                                                    ;REGISTERS, SINCE TDAR WILL BE USED
3519 022374  112737  000374  177751             MOVB    #374,CMR+1
3520 022402  012705  070000                     MOV     #70000,R5       ;;ADDRESS 70000 INTO R5
3521 022406  012703  050000                     MOV     #50000,R3       ;ADDRESS 50000 INTO R3
3522 022412  012737  000015  177746  1$:       MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE VALID STORE
3523 022420  112737  000003  177750             MOVB    #HODO+TDAR,CMR  ;HODO ALLOWS VALID STORE  SET B TO
3524                                                                    ;BE WRITTEN TO CMR<12> ONLY DURING
3525                                                                    ;THE DESTINATION MEMORY ACCESS.
3526                                                                    ;TDAR WILL FORCE A 0 TO BE WRITTEN
3527                                                                    ;INTO VALID STORE WHEN A WRITE TO
3528                                                                    ;VALID STORE OCCURS
3529 022426  005713                             TST     (R3)
3530 022430  005715                             TST     (R5)            ;WRITE A 0 INTO VALID STORE ADDRESS
3531                                                                    ;LOCATION SPECIFIED BY R5'S BITS 12 TO 1.
3532 022432  005715                             TST     (R5)            ;WRITE VALID STORE DATA INTO CMR<12>
3533                                                                    ;FROM VALID STORE ADDRESS LOCATION
3534                                                                    ;JUST WRITTEN INTO.
3535 022434  013701  177750             MOV     CMR,R1          ;SAVE CMR DATA
3536 022440  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     022442  000240                             NOP                     ;FOR  LOOP ON ERROR
3537 022444  105037  177750                     CLRB    CMR             ;DISABLE MAINT. MODE
3538 022450  012737  001015  177746             MOV     #OFF,CCR        ;DISABLE CACHE
3539 022456  032701  010000                     BIT     #VLD,R1         ;CMR<12> SHOULD BE 0.
3540 022462  001410                             BEQ     9$              ;PASS
3541
3542 022464  010537  047334                     MOV     R5,CA121        ;SAVE VALID STORE ADDRESS LOCATION
3543                                                                    ;USED: CA<12:1>
3544 022470  006237  047334                     ASR     CA121           ;PREPARE CA121 FOR TYPEOUT
3545 022474  104406                             ERROR                   ;ERROR
                                                                        ;-----
```

TEST # 134 - WRITE AND READ 0'S TO ALL HIGH CACHE VALID

```
        022476  022474                          .WORD   .-2
  3546
  3547                                                          ;VALID BITS STORE TESTS - SET B
  3548                                                          ;READING VALID STORE DATA SET B
  3549 022500  047334                          CA121           ;THRU CMR<12> DID NOT RESULT IN 0.
  3550                                                          ;PRINT VALID STORE ADDRESS LOCATION
  3551 022502  000000                          .WORD   0       ;USED: CA<12:1>.
  3552 022504  062705  000002          9$:     ADD     #2,R5   ;NEXT VALID STORE LOCATION
  3553 022510  062703  000002                  ADD     #2,R3
  3554 022514  020527  100000                  CMP     R5,#100000      ;HAVE ALL HIGH CACHE ADDRESS LOCATIONS BEEN DONE?
  3555 022520  001334                          BNE     1$              ;NO
  3556 022522  000240                  10$:    NOP                     ;END OF TEST
        022524  005237  001472                  INC     $TESTN          ;INCREMENT TEST COUNTER
```

TEST # 135 - WRITE AND READ 1'S TO ALL HIGH CACHE VALID

```
3562                                    .SBTTL  TEST # 135 - WRITE AND READ 1'S TO ALL HIGH CACHE VALID
                                        ;;*****************************************************************
                                        ;*TEST 135 - WRITE AND READ 1'S TO ALL HIGH CACHE VALID
                                        ;*      WRITE AND READ 1'S TO ALL HIGH CACHE  VALID
                                        ;*      BIT STORE ADDRESS LOCATIONS- SET B
                                        ;*      (VALID STORE LOCATIONS 4000 TO 7777)
                                        ;;*****************************************************************
     022530                             TST135:
3563 022530  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     022532  022542                             .WORD   40$             ;TEST START LOCATION
     022534  060036                             .WORD   1$-40$+57764    ;LOOP ON ERROR START LOCATION
     022536  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     022540  060064                             .WORD   25$-40$+57764   ;LOOP ON ERROR END LOCATION
     022542  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     022550  004437  002342                     JSR     R4,RELCTL       ;LOCATE TEST CODE TO LOW CACHE SPACE
     022554  022726                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO LOW CACHE SPACE

3564 022556  032737  020000  177746             BIT     #VSIU,CCR       ;IS SET B BEING USED?
3565 022564  001007                             BNE     3$              ;YES
3566 022566  052737  000400  177746             BIS     #FC,CCR         ;NO; FLUSH CACHE FOR SET B
3567 022574  032737  010000  177746  200$:      BIT     #VCIP,CCR       ;WAIT TILL FLUSH COMPLETE
3568 022602  001374                             BNE     200$
3569 022604  012705  070000          3$:        MOV     #70000,R5       ;;ADDRESS 70000 INTO R5
3570 022610  012703  050000                     MOV     #50000,R3       ;ADDRESS 50000 INTO R3
3571 022614  012737  000015  177746  1$:        MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE VALID STORE
3572 022622  112737  000002  177750             MOVB    #HODO,CMR       ;HODO ALLOWS VALID STORE  SET B TO
3573                                                                    ;BE WRITTEN TO CMR<12> ONLY DURING
3574                                                                    ;THE DESTINATION MEMORY ACCESS.
3575 022630  005713                             TST     (R3)
3576 022632  005715                             TST     (R5)            ;WRITE A 1 INTO VALID STORE ADDRESS
3577                                                                    ;LOCATION SPECIFIED BY R5'S BITS 12 TO 1.
3578 022634  005715                             TST     (R5)            ;WRITE VALID STORE DATA INTO CMR<12>
3579                                                                    ;FROM VALID STORE ADDRESS LOCATION
3580                                                                    ;JUST WRITTEN INTO.
3581 022636  013701  177750                     MOV     CMR,R1          ;SAVE CMR DATA
3582 022642  000240                 25$:        NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     022644  000240                             NOP                     ;FOR  LOOP ON ERROR
3583 022646  105037  177750                     CLRB    CMR             ;DISABLE MAINT. MODE
3584 022652  012737  001015  177746             MOV     #OFF,CCR        ;DISABLE CACHE
3585 022660  032701  010000                     BIT     #VLD,R1         ;CMR<12> SHOULD BE 1.
3586 022664  001010                             BNE     9$              ;PASS
3587 022666  010537  047334                     MOV     R5,CA121        ;SAVE VALID STORE ADDRESS LOCATION
3588                                                                    ;USED: CA<12:1>
3589 022672  006237  047334                     ASR     CA121           ;PREPARE CA121 FOR TYPEOUT
3590 022676  104406                             ERROR                   ;ERROR
                                                                        ;-----
     022700  022676                             .WORD   .-2
3591                                                                    ;VALID STORE BIT TEST- SET B
3592                                                                    ;READING VALID STORE DATA SET B
3593                                                                    ;THRU CMR<12> DID NOT RESULT IN 0.
3594 022702  047334                 CA121                              ;PRINT VALID STORE ADDRESS LOCATION
3595                                                                    ;USED: CA<12:1>.
3596 022704  000000                             .WORD   0
```

TEST # 135 - WRITE AND READ 1'S TO ALL HIGH CACHE VALID

```
3597 022706 062705 000002          9$:   ADD   #2,R5          ;NEXT VALID STORE LOCATION
3598 022712 062703 000002                ADD   #2,R3
3599 022716 020527 100000                CMP   R5,#100000    ;HAVE ALL HIGH CACHE ADDRESS LOCATIONS BEEN DONE?
3600 022722 001334                       BNE   1$            ;NO
3601 022724 000240                 10$:  NOP                 ;END OF TEST
     022726 005237 001472                INC   $TESTN        ;INCREMENT TEST COUNTER
```

```
3605                                    .SBTTL  TEST # 136 - CHK VALID DATA STORE ADRS LINES (CA(12:1)) SET B
                                        ;;*****************************************************************
                                        ;*TEST 136 - CHK VALID DATA STORE ADRS LINES (CA(12:1)) SET B
                                        ;*      VERIFY VALID DATA STORE ADDRESS LINES (CA<12:1>) -  SET B
                                        ;;*****************************************************************
     022732                             TST136:
3606 022732  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     022734  022744                             .WORD   40$             ;TEST START LOCATION
     022736  070054                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     022740  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     022742  070130                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     022744  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     022752  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     022756  023174                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

3607 022760  032737  020000  177746            BIT     #VSIU,CCR       ;IS SET B BEING USED?
3608 022766  001007                             BNE     3$              ;YES
3609 022770  052737  000400  177746            BIS     #FC,CCR         ;NO; FLUSH CACHE FOR SET B
3610 022776  032737  010000  177746  4$:       BIT     #VCIP,CCR       ;WAIT TILL FLUSH COMPLETE
3611 023004  001374                             BNE     4$
3612 023006  012737  000002  047344  3$:       MOV     #2,FLTPAT       ;1ST FLOATING CACHE DATA STORE ADDRESS PATTERN
3613 023014  012702  040000        2$:       MOV     #40000,R2       ;
3614 023020  012703  060000                    MOV     #60000,R3       ;
3615 023024  063702  047344                    ADD     FLTPAT,R2       ;R2 CONTAINS 40000+FLTPAT
3616 023030  063703  047344                    ADD     FLTPAT,R3       ;R3 CONTAINS 60000+FLTPAT
3617 023034  112737  000002  177750  1$:       MOVB    #HODO,CMR       ;HODO ALLOWS VALID DATA STORE BITS TO BE
3618                                                                    ;WRITTEN TO CMR<12> ONLY DURING THE
3619                                                                    ;DESTINATION MEMORY ACCESS OF AN INSTRUCTION.
3620 023042  012737  000015  177746            MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE VALID STORE
3621 023050  152737  000001  177750            BISB    #TDAR,CMR       ;TDAR WILL FORCE A 0 TO BE WRITTEN
3622                                                                    ;INTO VALID STORE WHEN A WRITE TO
3623                                                                    ;VALID STORE OCCURS.
3624 023056  005737  040000                    TST     40000
3625 023062  005737  060000                    TST     60000           ;WRITE 0 INTO VALID STORE LOCATION 0000.
3626 023066  142737  000001  177750            BICB    #TDAR,CMR       ;CLEARING TDAR WILL ALLOW A 1 TO BE
3627                                                                    ;WRITTEN INTO VALID STORE WHEN A WRITE
3628                                                                    ;TO VALID STORE OCCURS.
3629 023074  005712                             TST     (R2)
3630 023076  005713                             TST     (R3)            ;WRITE 1 INTO VALID STORE LOCATION
3631                                                                    ;SPECIFIED BY R3'S BITS 1 THRU 12:CA<12:1>.
3632 023100  005737  060000                    TST     60000           ;LOAD DATA FROM VALID DATA STORE LOCATION
3633                                                                    ;0000 INTO CMR<12>.
3634 023104  013701  177750                    MOV     CMR,R1          ;SAVE CMR DATA
3635 023110  000240              25$:       NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     023112  000240                             NOP                     ;FOR  LOOP ON ERROR
3636 023114  105037  177750                    CLRB    CMR             ;DISABLE MAINT. MODE
3637 023120  012737  001015  177746            MOV     #OFF,CCR        ;DISABLE CACHE
3638 023126  032701  010000                    BIT     #VLD,R1         ;CMR<12> SHOULD READ 0.
3639 023132  001411                             BEQ     9$                      ;PASS
3640                                                                                    ;ROUTINE
3641 023134  013737  047344  047334            MOV     FLTPAT,CA121    ;SAVE CA<12:1> USED
3642 023142  006237  047334                    ASR     CA121           ;PREPARE CA121 FOR TYPEOUT
3643 023146  104406                             ERROR                   ;ERROR
```

```
                                                                                ;-----
      023150  023146                          .WORD   .-2
 3644                                                                           ;VALID STORE ADDRESS VERIFICATION- SET B
 3645                                                                           ;VALID STORE LOCATION 0000 DID NOT
 3646                                                                           ;READ AS A 0 INDICATING THAT IT WAS
 3647                                                                           ;OVERWRITTEN WITH A 1. THIS SUGGESTS
 3648                                                                           ;A BAD CA<12:1> VALID STORE ADDRESS LINE.
 3649 023152  047334                          CA121                            ;PRINT VALID STORE ADDRESS FAILURE: CA<12:1>.
 3650                                                                           ;NOTE THAT THE 1 IN THIS PATTERN
 3651                                                                           ;WILL POINT TO THE ADDRESS LINE
 3652                                                                           ;THAT BROUGHT OUT ERROR.
 3653 023154  000000                          .WORD   0
 3654 023156  006337  047344          9$:     ASL     FLTPAT                   ;NEXT PATTERN
 3655 023162  022737  020000  047344          CMP     #20000,FLTPAT            ;HAS VALID DATA STORE  ADDRESS 4000 BEEN DONE?
 3656 023170  001311                          BNE     2$                       ;NO
 3657 023172  000240                  10$:    NOP                              ;END OF TEST
      023174  005237  001472                  INC     $TESTN                   ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 137 - ALL LOW CACHE VALID STORE SET B ADDRESS LOCATIONS
                                ;;*********************************************************************
                                ;*TEST 137 - ALL LOW CACHE VALID STORE SET B ADDRESS LOCATIONS
                                ;*      VERIFY THAT ALL LOW CACHE VALID STORE SET B ADDRESS LOCATIONS
                                ;*      WILL BE INVALIDATED AS A RESULT OF A CACHE FLUSH.
                                ;*      (FLUSH COUNTER ADDRESS LOCATIONS [CNT<12:1>]: 0000-3777)
                                ;;*********************************************************************
     023200                     TST137:
3664 023200  000004                     SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                 ;ERROR/LOOP ON TEST
     023202  023212                      .WORD   40$             ;TEST START LOCATION
     023204  070074                      .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     023206  000000                      .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     023210  070130                      .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     023212  012737  001015  177746 40$:  MOV     #OFF,CCR        ;DISABLE CACHE
     023220  004437  002370              JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     023224  023452                      .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO HI CACHE SPACE

3665 023226  012705  060000              MOV     #60000,R5       ;;ADDRESS 60000 INTO R5
3666 023232  012703  040000              MOV     #40000,R3       ;ADDRESS 40000 INTO R3
3667 023236  032737  020000  177746      BIT     #VSIU,CCR       ;IS SET B BEING USED?
3668 023244  001007                      BNE     3$              ;YES
3669 023246  052737  000400  177746      BIS     #FC,CCR         ;NO; FLUSH CACHE FOR SET B
3670 023254  032737  010000  177746 200$: BIT     #VCIP,CCR       ;WAIT TILL FLUSH COMPLETE
3671 023262  001374                      BNE     200$
3672 023264  012737  000015  177746 3$:   MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE VALID STORE
3673 023272  112737  000002  177750      MOVB    #HODO,CMR       ;HODO ALLOWS VALID STORE  SET B TO
3674                                                             ;BE WRITTEN TO CMR<12> ONLY DURING
3675                                                             ;THE DESTINATION MEMORY ACCESS.
3676 023300  005713              4$:     TST     (R3)
3677 023302  005715                      TST     (R5)            ;WRITE A 1 INTO VALID STORE ADDRESS
3678                                                             ;LOCATION SPECIFIED BY R5'S BITS 12 TO 1.
3679 023304  062705  000002              ADD     #2,R5           ;NEXT VALID STORE LOCATION
3680 023310  062703  000002              ADD     #2,R3
3681 023314  020527  070000              CMP     R5,#70000       ;HAVE ALL LOW CACHE LOCATIONS BEEN DONE?
3682 023320  001367                      BNE     4$              ;NO
3683 023322  052737  000400  177746 1$:   BIS     #FC,CCR         ;FLUSH CACHE TO SELECT SET A AND
3684                                                             ;INVALIDATE SET B
3685 023330  032737  010000  177746 500$: BIT     #VCIP,CCR       ;WAIT TILL FLUSH COMPLETE
3686 023336  001374                      BNE     500$
3687 023340  052737  000400  177746      BIS     #FC,CCR         ;FLUSH TO SELECT SET B AGAIN
3688 023346  032737  010000  177746 6$:   BIT     #VCIP,CCR       ;WAIT
3689 023354  001374                      BNE     6$
3690 023356  000240              25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     023360  000240                      NOP                     ;FOR  LOOP ON ERROR
3691 023362  012705  060000              MOV     #60000,R5       ;ADDRESS 60000 INTO R5
3692 023366  005715              2$:     TST     (R5)            ;WRITE VALID STORE DATA INTO CMR<12>
3693                                                             ;FROM ADDRESS LOCATION SPECIFIED BY
3694                                                             ;R5'S BITS 12-1.
3695 023370  013701  177750              MOV     CMR,R1          ;SAVE CMR DATA
3696 023374  032701  010000              BIT     #VLD,R1         ;CMR<12> SHOULD BE 0
3697 023400  001416                      BEQ     9$              ;PASS
3698 023402  105037  177750              CLRB    CMR             ;DISABLE MAINT MODE
3699 023406  012737  001015  177746      MOV     #OFF,CCR        ;DISABLE CACHE
```

TEST # 137 - ALL LOW CACHE VALID STORE SET B ADDRESS LOCATIONS

```
3700 023414  010537  047342                MOV     R5,CNT121       ;SAVE VALID STORE FLUSH ADDRESS LOCATION
3701                                                                 ;USED: CNT<12:1>
3702 023420  006237  047342                ASR     CNT121          ;PREPARE CNT121 FOR TYPEOUT
3703 023424  104406                        ERROR                   ;ERROR
                                                                     ;-----
     023426  023424                        .WORD   .-2
3704                                                                 ;FLUSH CACHE INVALID TEST-SET B
3705                                                                 ;READING VALID STORE LOCATION FROM SET B THRU CMR<12>
3706                                                                 ;DID NOT RESULT IN A ZERO,INDICATING THAT
3707                                                                 ;THE CACHE FLUSH DID NOT INVALIDATE THIS
3708                                                                 ; LOCATION.
3709 023430  047342                        CNT121                  ;PRINT VALID STORE FLUSH ADDRESS LOCATION
3710                                                                 ;IN ERROR: CNT<12:1>.
3711 023432  000000                        .WORD   0
3712 023434  000405                        BR      10$             ;IF ERROR, END TEST
3713 023436  062705  000002          9$:   ADD     #2,R5           ;NEXT VALID STORE LOCATION
3714 023442  020527  070000                CMP     R5,#70000       ;HAVE ALL LOW CACHE ADDRESS LOCATIONS BEEN DONE?
3715 023446  001347                        BNE     2$              ;NO
3716 023450  000240                10$:   NOP                     ;END OF TEST
     023452  005237  001472                INC     $TESTN          ;INCREMENT TEST COUNTER
```

TEST # 140 - ALL HI CACHE VALID STORE SET B ADDRESS LOCATIONS

```
   3722                                 .SBTTL  TEST # 140 - ALL HI CACHE VALID STORE SET B ADDRESS LOCATIONS
                                        ;;*********************************************************************
                                        ;*TEST 140 - ALL HI CACHE VALID STORE SET B ADDRESS LOCATIONS
                                        ;*      VERIFY THAT ALL HI CACHE VALID STORE SET B ADDRESS LOCATIONS
                                        ;*      WILL BE INVALIDATED AS A RESULT OF A CACHE FLUSH.
                                        ;*      (FLUSH COUNTER ADDRESS LOCATIONS [CNT<12:1>]: 4000-7777)
                                        ;;*********************************************************************
        023456                          TST140:
   3723 023456  000004                          SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
        023460  023470                  .WORD   40$                     ;TEST START LOCATION
        023462  060074                  .WORD   1$-40$+57764            ;LOOP ON ERROR START LOCATION
        023464  000000                  .WORD   0                       ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
        023466  060130                  .WORD   25$-40$+57764           ;LOOP ON ERROR END LOCATION
        023470  012737  001015  177746  40$:    MOV     #OFF,CCR        ;DISABLE CACHE
        023476  004437  002342          JSR     R4,RELCTL               ;LOCATE TEST CODE TO LOW CACHE SPACE
        023502  023730                  .WORD   10$+2                   ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO LOW CACHE SPACE

   3724 023504  012705  070000          MOV     #70000,R5               ;;ADDRESS 70000 INTO R5
   3725 023510  012703  050000          MOV     #50000,R3               ;ADDRESS 50000 INTO R3
   3726 023514  032737  020000  177746  BIT     #VSIU,CCR               ;IS SET B BEING USED?
   3727 023522  001007                  BNE     3$                      ;YES
   3728 023524  052737  000400  177746  BIS     #FC,CCR                 ;NO; FLUSH CACHE FOR SET B
   3729 023532  032737  010000  177746  200$:   BIT     #VCIP,CCR       ;WAIT TILL FLUSH COMPLETE
   3730 023540  001374                  BNE     200$
   3731 023542  012737  000015  177746  3$:     MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE VALID STORE
   3732 023550  112737  000002  177750  MOVB    #HODO,CMR               ;HODO ALLOWS VALID STORE  SET B TO
   3733                                                                 ;BE WRITTEN TO CMR<12> ONLY DURING
   3734                                                                 ;THE DESTINATION MEMORY ACCESS.
   3735 023556  005713                  4$:     TST     (R3)
   3736 023560  005715                  TST     (R5)                    ;WRITE A 1 INTO VALID STORE ADDRESS
   3737                                                                 ;LOCATION SPECIFIED BY R5'S BITS 12 TO 1.
   3738 023562  062705  000002          ADD     #2,R5                   ;NEXT VALID STORE LOCATION
   3739 023566  062703  000002          ADD     #2,R3
   3740 023572  020527  100000          CMP     R5,#100000              ;HAVE ALL HI CACHE LOCATIONS BEEN DONE?
   3741 023576  001367                  BNE     4$                      ;NO
   3742 023600  052737  000400  177746  1$:     BIS     #FC,CCR         ;FLUSH CACHE TO SELECT SET A AND
   3743                                                                 ;INVALIDATE SET B
   3744 023606  032737  010000  177746  500$:   BIT     #VCIP,CCR       ;WAIT TILL FLUSH COMPLETE
   3745 023614  001374                  BNE     500$
   3746 023616  052737  000400  177746          BIS     #FC,CCR         ;FLUSH TO SELECT SET B AGAIN
   3747 023624  032737  010000  177746  6$:     BIT     #VCIP,CCR       ;WAIT
   3748 023632  001374                  BNE     6$
   3749 023634  000240                  25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
        023636  000240                  NOP                             ;FOR  LOOP ON ERROR
   3750 023640  012705  070000          MOV     #70000,R5               ;ADDRESS 70000 INTO R5
   3751 023644  005715                  2$:     TST     (R5)            ;WRITE VALID STORE DATA INTO CMR<12>
   3752                                                                 ;FROM ADDRESS LOCATION SPECIFIED BY
   3753                                                                 ;R5'S BITS 12-1.
   3754 023646  013701  177750          MOV     CMR,R1                  ;SAVE CMR DATA
   3755 023652  032701  010000          BIT     #VLD,R1                 ;CMR<12> SHOULD BE 0
   3756 023656  001416                  BEQ     9$                      ;PASS
   3757 023660  105037  177750          CLRB    CMR                     ;DISABLE MAINT MODE
   3758 023664  012737  001015  177746  MOV     #OFF,CCR                ;DISABLE CACHE
```

```
3759 023672  010537  047342                MOV     R5,CNT121       ;SAVE VALID STORE FLUSH ADDRESS LOCATION
3760                                                                ;USED: CNT<12:1>
3761 023676  006237  047342                ASR     CNT121          ;PREPARE CNT121 FOR TYPEOUT
3762 023702  104406                        ERROR                   ;ERROR
                                                                    ;-----
     023704  023702                        .WORD   .-2
3763                                                                ;FLUSH CACHE INVALID TEST-SET B
3764                                                                ;READING VALID STORE LOCATION FROM SET B THRU CMR<12>
3765                                                                ;DID NOT RESULT IN A ZERO,INDICATING THAT
3766                                                                ;THE CACHE FLUSH DID NOT INVALIDATE THIS
3767                                                                ; LOCATION.
3768 023706  047342                        CNT121                  ;PRINT VALID STORE FLUSH ADDRESS LOCATION
3769                                                                ;IN ERROR: CNT<12:1>.
3770 023710  000000                        .WORD   0
3771 023712  000405                        BR      10$             ;IF ERROR,END TEST
3772 023714  062705  000002          9$:   ADD     #2,R5           ;NEXT VALID STORE LOCATION
3773 023720  020527  100000                CMP     R5,#100000      ;HAVE ALL HI CACHE ADDRESS LOCATIONS BEEN DONE?
3774 023724  001347                        BNE     2$              ;NO
3775 023726  000240                10$:   NOP                     ;END OF TEST
     023730  005237  001472                INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                        .SBTTL  TEST # 141 - TEST UPDATE TO CACHE DATA ON HIT/MISS
                                        ;;*****************************************************************
                                        ;*TEST 141 - TEST UPDATE TO CACHE DATA ON HIT/MISS
                                        ;*      VERIFY THE FOLLOWING:
                                        ;*              1. NO UPDATE OCCURS TO CACHE DATA STORE DUE TO A WRITE MISS
                                        ;*              2. UPDATE DOES OCCUR TO CACHE DATA STORE DUE TO A WRITE HIT
                                        ;;*****************************************************************
     023734
3782 023734  000004                    TST141:
                                                SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     023736  023746                             .WORD   40$             ;TEST START LOCATION
     023740  070000                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     023742  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     023744  070064                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     023746  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     023754  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     023760  024154                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

3783 023762  005037  060000            1$:     CLR     60000           ;0'S TO MAIN MEMORY LOCATION
3784 023766  005037  000000                    CLR     0               ;CLEAR LOCATION 0
3785 023772  012700  177777                    MOV     #-1,R0          ;ALL 1'S TO R0
3786 023776  012701  060000                    MOV     #60000,R1       ;ADDRESS 60000 TO R1
3787 024002  112737  000002  177750            MOVB    #HODO,CMR       ;ALLOWS CACHE UPDATES &  DATA STORE BITS TO BE
3788                                                                    ;WRITTEN TO CDR<15:0> ONLY DURING THE
3789                                                                    ;DESTINATION MEMORY ACCESS OF AN INSTRUCTION.
3790 024010  012737  000015  177746            MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE CACHE STORE
3791 024016  005737  060000                    TST     60000           ;
3792 024022  005737  000000                    TST     0               ;READ UPDATE;  ALL 0'S TO  DATA STORE
3793                                                                    ;LOCATION 0000 FROM MAIN MEMORY
3794                                                                    ;LOC. 0
3795 024026  010011                            MOV     R0,(R1)         ;WRITE MISS;NO UPDATE SHOULD OCCUR
3796                                                                    ;TO DATA STORE LOCATION 0000
3797 024030  005711                            TST     (R1)            ;READ MISS;LOAD DATA STORE BITS RESULTING
3798                                                                    ;FROM PREVIOUS WRITE MISS INTO CDR<15:0>
3799 024032  013702  177754                    MOV     CDR,R2          ;SAVE CDR CONTENTS
3800 024036  010011                            MOV     R0,(R1)         ;WRITE HIT;
3801                                                                    ;THIS WRITE HIT SHOULD UPDATE DATA
3802                                                                    ;STORE LOCATION 0000.
3803 024040  005711                            TST     (R1)            ;READ HIT;LOAD DATA STORE BITS RESULTING
3804                                                                    ;FROM PREVIOUS WRITE HIT INTO CDR<15:0>
3805 024042  013703  177754                    MOV     CDR,R3          ;SAVE CDR CONTENTS
3806 024046  000240                    25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     024050  000240                            NOP                     ;FOR  LOOP ON ERROR
3807 024052  105037  177750                    CLRB    CMR             ;DISABLE MAINTENANCE
3808 024056  012737  001015  177746            MOV     #OFF,CCR        ;DISABLE CACHE
3809 024064  012737  000002  000000            MOV     #2,0            ;RESTORE VECTOR
3810 024072  005702                            TST     R2              ;CHECK FOR ALL 0'S
3811 024074  001411                            BEQ     8$              ;PASS
3812 024076  005037  047332                    CLR     EXDAT6          ;SPECIFY EXPECTED DATA
3813 024102  010237  047330                    MOV     R2,CDR150       ;GET RECEIVED DATA FROM R2
3814 024106  104406                            ERROR                   ;ERROR
                                                                        ;-----
     024110  024106                            .WORD   .-2
3815                                                                    ;WRITE CONTROL LOGIC TEST
```

```
                                                                ;READING CDR<15:0> DID NOT RESULT IN ALL 0'S.
                                                                ;INDICATES THAT UPDATE  OCCURED
                                                                ;DUE TO WRITE MISS.
024112  047332                          EXDAT6                  ;PRINT CDR<15:0> EXPECTED DATA
024114  047330                          CDR150                  ;PRINT CDR<15:0> DATA RECEIVED.
024116  000000                          .WORD   0
024120  022703  177777          8$:     CMP     #-1,R3          ;CHECK FOR ALL 1'S
024124  001412                          BEQ     10$             ;PASS
024126  012737  177777  047332          MOV     #-1,EXDAT6      ;SPECIFY EXPECTED DATA
024134  010337  047330                  MOV     R3,CDR150       ;GET RECEIVED DATA FROM R3
024140  104406                          ERROR                   ;ERROR
                                                                ;-----
024142  024140                          .WORD   .-2
                                                                ;WRITE CONTROL LOGIC TEST
                                                                ;READING CDR<15:0> DID NOT RESULT IN ALL 1'S.
                                                                ;INDICATES THAT UPDATE  DID NOT OCCUR
                                                                ;DUE TO WRITE HIT.
024144  047332                          EXDAT6                  ;PRINT CDR<15:0> EXPECTED DATA
024146  047330                          CDR150                  ;PRINT CDR<15:0> DATA RECEIVED.
024150  000000                          .WORD   0
024152  000240                  10$:     NOP                     ;END OF TEST
024154  005237  001472                  INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
3842                                    .SBTTL  TEST # 142 - TEST WRITE CONTROL LOGIC INHIBIT MODE
                                        ;;*****************************************************************
                                        ;*TEST 142 - TEST WRITE CONTROL LOGIC INHIBIT MODE
                                        ;*      VERIFY THAT THE WRITE CONTROL LOGIC WILL BE INHIBITED FROM UPDATING
                                        ;*      TAG STORE DUE TO A READ HIT.
                                        ;*PROCEDURE:  CREATE READ HIT TO LOW CACHE WITH FMLO ENABLED.  FMLO WILL
                                        ;*      INHIBIT CPU RESTART SIGNAL SO THAT A POTENTIAL WRITE SIGNAL COULD
                                        ;*      CONTROL LOGIC SHOULD BE INHIBITED DUE TO READ HIT.
                                        ;;*****************************************************************
     024160                             TST142:
3843 024160  000004                            SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     024162  024172                             .WORD   40$             ;TEST START LOCATION
     024164  070000                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     024166  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     024170  070064                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     024172  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     024200  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     024204  024364                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

3844 024206  012737  177777  177752  1$:        MOV     #-1,CHR         ;LOAD AMR<8:0> BY WRITING ALL 1'S TO CHR<8:0>
3845 024214  112737  000002  177750             MOVB    #HODO,CMR       ;HODO ALLOWS CACHE TAG FIELD BITS TO BE
3846                                                                    ;WRITTEN TO CHR<15:07> ONLY DURING
3847                                                                    ;THE DESTINATION MEMORY ACCESS
3848                                                                    ;OF AN INSTRUCTION
3849 024222  012737  000015  177746             MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE
3850 024230  005737  040000                     TST     40000
3851 024234  005737  000000                     TST     0               ;READ UPDATE;LOAD TAG STORE WITH ALL 0'S
3852 024240  052737  000001  177750             BIS     #TDAR,CMR       ;TDAR WILL ALLOW TAG STORE TO BE
3853                                                                    ;WRITTEN WITH CONTENTS OF AMR<8:0>
3854                                                                    ;IF AN UPDATE OCCURS.
3855 024246  005737  000000                     TST     0               ;READ HIT; WRITE CONTROL LOGIC SHOULD
3856                                                                    ;BE INHIBITED FROM ISSUING A WRITE
3857                                                                    ;SIGNAL
3858 024252  005737  000000                     TST     0               ;WRITE TAG FIELD DATA FROM TAG STORE
3859                                                                    ;LOCATION 0000 INTO CHR.
3860 024256  013737  177752  047322             MOV     CHR,CHR157      ;SAVE CHR DATA
3861 024264  012737  001015  177746             MOV     #OFF,CCR        ;DISABLE CACHE
3862 024272  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     024274  000240                             NOP                     ;FOR  LOOP ON ERROR
3863 024276  105037  177750                     CLRB    CMR             ;DISABLE MAINTENANCE MODE
3864 024302  042737  000177  047322             BIC     #177,CHR157     ;INTERESTED IN 15:07
3865 024310  005737  047322                     TST     CHR157          ;BITS 15:07 SHOULD BE ALL 0'S
3866 024314  001422                             BEQ     10$             ;PASS
3867 024316  012737  000007  002062             MOV     #7,LOOP         ;ERROR;PREPARE CHR157 FOR TYPEOUT
3868 024324  006237  047322             2$:     ASR     CHR157
3869 024330  042737  100000  047322             BIC     #100000,CHR157
3870 024336  005337  002062                     DEC     LOOP
3871 024342  001370                             BNE     2$
3872 024344  005037  047350                     CLR     EXDAT3          ;INDICATE EXPECTED DATA
3873 024350  104406                             ERROR                   ;ERROR
                                                                        ;-----
     024352  024350                             .WORD   .-2
3874                                                                    ;WRITE CONTROL LOGIC TESTS
```

```
 3875                                                                   ;READING TAG STORE DATA THRU CHR<15:07>
 3876                                                                   ;DID NOT RESULT IN ALL 0'S.
 3877                                                                   ;THIS SUGGESTS THAT AN UPDATE OCCURED
 3878                                                                   ;AND WRITE CONTROL LOGIC WAS NOT
 3879                                                                   ;INHIBITED DUE TO READ HIT.
 3880 024354  047350                        EXDAT3                     ;PRINT CHR<15:07> EXPECTED
 3881 024356  047322                        CHR157                     ;PRINT CHR<15:07> RECEIVED
 3882 024360  000000                        .WORD   0
 3883 024362  000240                10$:    NOP                        ;END OF TEST
      024364  005237  001472               INC     $TESTN             ;INCREMENT TEST COUNTER
```

TEST # 143 - WRITE CONTROL LOGIC INHIBIT TEST

```
                                        .SBTTL  TEST # 143 - WRITE CONTROL LOGIC INHIBIT TEST
                                        ;;*********************************************************************
                                        ;*TEST 143 - WRITE CONTROL LOGIC INHIBIT TEST
                                        ;*      VERIFY THAT WRITE CONTROL LOGIC WILL INHIBIT A READ UPDATE
                                        ;*      TO CACHE TAG STORE DUE TO AN ACCESS TO I/O PAGE.
                                        ;;*********************************************************************
     024370                             TST143:
3889 024370  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     024372  024402                             .WORD   40$             ;TEST START LOCATION
     024374  060000                             .WORD   1$-40$+57764    ;LOOP ON ERROR START LOCATION
     024376  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR THIS TEST
     024400  060042                             .WORD   25$-40$+57764   ;LOOP ON ERROR END LOCATION
     024402  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     024410  004437  002342                     JSR     R4,RELCTL       ;LOCATE TEST CODE TO LOW CACHE SPACE
     024414  024564                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO LOW CACHE SPACE

3890 024416  112737  000002  177750  1$:        MOVB    #HODO,CMR       ;ALLOWS CACHE TAG FIELD BITS TO BE
3891                                                                    ;WRITTEN TO CHR<15:07> ONLY DURING
3892                                                                    ;THE DESTINATION MEMORY ACCESS
3893                                                                    ;OF AN INSTRUCTION
3894 024424  012737  000015  177746             MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE CACHE STORE
3895 024432  005737  057744                     TST     57744
3896 024436  005737  077744                     TST     77744           ;READ UPDATE;LOAD BIT PATTERN
3897                                                                    ;000000011 INTO TAG STORE LOCATION
3898                                                                    ;7762
3899 024442  005737  177744                     TST     177744          ;ACCESS I/O PAGE BY READING CCR REGISTER.
3900                                                                    ;THE CACHE COULD DO AN UPDATE TO
3901                                                                    ;TAG STORE LOCATION 7762 BUT THE ACCESS
3902                                                                    ;TO I/O PAGE WILL INHIBIT WRITE CONTROL
3903                                                                    ;LOGIC
3904 024446  005737  057744                     TST     57744           ;WRITE TAG STORE DATA FROM  LOCATION
3905                                                                    ;7762 INTO CHR<15:07>.
3906 024452  013737  177752  047322             MOV     CHR,CHR157      ;SAVE CHR DATA
3907 024460  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     024462  000240                             NOP                     ;FOR  LOOP ON ERROR
3908 024464  105037  177750                     CLRB    CMR             ;DISABLE MAINTENANCE MODE
3909 024470  012737  001015  177746             MOV     #OFF,CCR        ;DISABLE CACHE
3910 024476  042737  000177  047322             BIC     #177,CHR157     ;PREPARE CHR157 FOR ERROR CHECK
3911 024504  022737  000600  047322             CMP     #600,CHR157     ;BITS 15:07 SHOULD BE BIT PATTERN 000000011
3912 024512  001423                             BEQ     10$             ;PASS
3913 024514  012737  000007  002062             MOV     #7,LOOP         ;ERROR;PREPARE CHR157 FOR TYPEOUT
3914 024522  006237  047322             2$:     ASR     CHR157
3915 024526  042737  100000  047322             BIC     #100000,CHR157
3916 024534  005337  002062                     DEC     LOOP
3917 024540  001370                             BNE     2$
3918 024542  012737  000003  047350             MOV     #3,EXDAT3       ;INDICATE EXPECTED DATA
3919 024550  104406                             ERROR                   ;ERROR
                                                                        ;-----
     024552  024550                             .WORD   .-2
3920                                                                    ;WRITE CONTROL LOGIC TESTS
3921                                                                    ;READING TAGD<21:13> THRU CHR<15:07>
3922                                                                    ;DID NOT RESULT IN BIT PATTERN 000000011.
3923 024554  047350                     EXDAT3                         ;PRINT CHR 15:07 EXPECTED
```

TEST # 143 - WRITE CONTROL LOGIC INHIBIT TEST

```
 3924 024556  047322                        CHR157                  ;PRINT CHR <15:07> RECEIVED
 3925 024560  000000                        .WORD   0
 3926 024562  000240                 10$:    NOP                     ;END OF TEST
      024564  005237  001472                INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
   3940                                 .SBTTL  TEST # 144 - WRITE CONTROL AND VALID STORE LOGIC TEST
                                        ;;**********************************************************************
                                        ;*TEST 144 - WRITE CONTROL AND VALID STORE LOGIC TEST
                                        ;*      THIS TEST VERIFIES THE AREA OF WRITE CONTROL LOGIC AND VALID
                                        ;*      STORE LOGIC THAT IS CONCERNED WITH BYPASS OPERATIONS. A WIRE STRAP
                                        ;*      IS USED TO ALLOW OR INHIBIT INVALIDATION OF VALID STORE DURING
                                        ;*      READ BYPASS CONDITIONS. UNLESS SWITCH REGISTER 08 IS IMPLEMENTED,
                                        ;*      THIS TEST ASSUMES THAT STRAP W1 IS IN PLACE.
                                        ;*PROCEDURE:    IF SWR 08 IS NOT IMPLEMENTED ,W1 IS ASSUMED IN PLACE. NO
                                        ;*      INVALIDATION OF VALID STORE SET A SHOULD OCCUR DUE TO READ MISS/BYPASS
                                        ;*      AND READ HIT/BYPASS CONDITIONS.  2. IF SWR 08 IS IMPLEMENTED, STRAP
                                        ;*      W2 IS ASSUMED IN PLACE. NO INVALIDATION SHOULD OCCUR DUE TO READ
                                        ;*      MISS/BYPASS, BUT INVALIDATION SHOULD OCCUR DUE TO READ HIT/BYPASS
                                        ;*      CONDITION.
                                        ;;**********************************************************************
     024570                             TST144:
   3941 024570  000004                          SCPCND                          ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                                ;ERROR/LOOP ON TEST
        024572  024602                          .WORD   40$                     ;TEST START LOCATION
        024574  070026                          .WORD   1$-40$+67764            ;LOOP ON ERROR START LOCATION
        024576  000000                          .WORD   0                       ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
        024600  070112                          .WORD   25$-40$+67764           ;LOOP ON ERROR END LOCATION
        024602  012737  001015  177746  40$:    MOV     #OFF,CCR                ;DISABLE CACHE
        024610  004437  002370                  JSR     R4,RELCTH               ;LOCATE TEST CODE TO HIGH CACHE SPACE
        024614  025036                          .WORD   10$+2                   ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

   3942 024616  032737  020000  177746          BIT     #VSIU,CCR               ;IS SET A BEING USED?
   3943 024624  001407                          BEQ     1$                      ;YES
   3944 024626  052737  000400  177746          BIS     #FC,CCR                 ;NO,FLUSH CACHE FOR SET A
   3945 024634  032737  010000  177746  200$:   BIT     #VCIP,CCR               ;WAIT TILL FLUSH COMPLETE
   3946 024642  001374                          BNE     200$
   3947 024644  012737  000015  177746  1$:     MOV     #15,CCR                 ;NO UCB SO AS TO ENABLE CACHE STORES
   3948 024652  112737  000002  177750          MOVB    #HODO,CMR               ;HODO ALLOWS READ UPDATES,AND VALID
   3949                                                                         ;STORE DATA TO BE WRITTEN TO CMR <12>
   3950                                                                         ;ONLY DURING THE DESTINATION ACCESS
   3951                                                                         ;OF AN INSTRUCTION.
   3952 024660  005737  040000                  TST     40000                   ;
   3953 024664  005737  060000                  TST     60000                   ;READ UPDATE TO CACHE LOCATION 0000.
   3954                                                                         ;WRITE 1 INTO VALID STORE LOCATION 0000.
   3955 024670  052737  001000  177746          BIS     #UCB,CCR                ;BYPASS MODE
   3956 024676  005737  040000                  TST     40000                   ;READ MISS/BYPASS;
   3957 024702  005737  060000                  TST     60000                   ;LOAD VALID STORE LOCATION 0000 DATA
   3958                                                                         ;RESULTING FROM PREVIOUS READ MISS/BYPASS
   3959                                                                         ;INTO CMR<12>.
   3960                                                                         ;THIS IS ALSO A READ HIT/BYPASS CONDITION.
   3961 024706  013700  177750                  MOV     CMR,R0                  ;SAVE CMR CONTENTS
   3962 024712  005737  040000                  TST     40000                   ;LOAD VALID STORE LOCATION 0000
   3963                                                                         ;DATA RESULTING FROM PREVIOUS READ HIT
   3964                                                                         ;/BYPASS INTO CMR<12>.
   3965 024716  013701  177750                  MOV     CMR,R1                  ;SAVE CMR CONTENTS
   3966 024722  012737  001015  177746          MOV     #OFF,CCR                ;DISABLE CACHE
   3967 024730  000240                  25$:    NOP                             ;INSTRUCTION 'JMP 1$' PLACED HERE
        024732  000240                          NOP                             ;FOR  LOOP ON ERROR
   3968 024734  105037  177750                  CLRB    CMR                     ;DISABLE MAINTENANCE MODE
```

```
 3969 024740  012702  002074              MOV     #SWR,R2         ;
 3970 024744  032732  000400              BIT     #BIT08,@(R2)+   ;IS STRAP W2 IN PLACE
 3971 024750  001015                      BNE     7$              ;YES
 3972 024752  032700  010000              BIT     #VLD,R0         ;NO; W1 IS ASSUMED
 3973 024756  001003                      BNE     6$              ;PASS ;VALID DATA IS A 1
 3974 024760  104406                      ERROR                   ;ERROR
                                                                  ;-----
      024762  024760                      .WORD   .-2
 3975                                                             ;WRITE CONTROL LOGIC TESTS
 3976                                                             ;STRAP W1 IS ASSUMED IN PLACE.
 3977                                                             ;READ MISS/BYPASS CAUSED INVALIDATION
 3978                                                             ;OF LOCATION 0000.
 3979 024764  000000                      .WORD   0
 3980 024766  032701  010000        6$:   BIT     #VLD,R1         ;TEST VALID DATA HELD IN R1
 3981 024772  001020                      BNE     10$             ;PASS; STILL A 1
 3982 024774  104406                      ERROR                   ;ERROR
                                                                  ;-----
      024776  024774                      .WORD   .-2
 3983                                                             ;WRITE CONTROL LOGIC TESTS
 3984                                                             ;STRAP W1 IS ASSUMED IN PLACE.
 3985                                                             ;READ MISS/HIT CAUSED INVALIDATION
 3986                                                             ;OF LOCATION 0000.
 3987 025000  000000                      .WORD   0
 3988 025002  000414                      BR      10$
 3989 025004  032700  010000        7$:   BIT     #VLD,R0         ; W2 IS ASSUMED IN PLACE
 3990 025010  001003                      BNE     8$              ;PASS ;VALID DATA IS A 1
 3991 025012  104406                      ERROR                   ;ERROR
                                                                  ;-----
      025014  025012                      .WORD   .-2
 3992                                                             ;WRITE CONTROL LOGIC TESTS
 3993                                                             ;STRAP W2 IS ASSUMED IN PLACE.
 3994                                                             ;READ MISS/BYPASS CAUSED INVALIDATION
 3995                                                             ;OF LOCATION 0000.
 3996 025016  000000                      .WORD   0
 3997 025020  032701  010000        8$:   BIT     #VLD,R1         ;TEST VALID DATA HELD IN R1
 3998 025024  001403                      BEQ     10$             ;PASS; VALID DATA  IS A 0
 3999 025026  104406                      ERROR                   ;ERROR
                                                                  ;-----
      025030  025026                      .WORD   .-2
 4000                                                             ;WRITE CONTROL LOGIC TESTS
 4001                                                             ;STRAP W2 IS ASSUMED IN PLACE.
 4002                                                             ;READ MISS/HIT DID NOT CAUSE INVALIDATION
 4003                                                             ;OF LOCATION 0000.
 4004 025032  000000                      .WORD   0
 4005 025034  000240                10$:  NOP                     ;END OF TEST
      025036  005237  001472              INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                        .SBTTL  TEST # 145 - WRITE HIT IN BYPASS MODE INVALIDATES CACHE LOCATION
                                        ;;*****************************************************************
                                        ;*TEST 145 - WRITE HIT IN BYPASS MODE INVALIDATES CACHE LOCATION
                                        ;;*****************************************************************
     025042                             TST145:
4007 025042  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     025044  025054                             .WORD   40$             ;TEST START LOCATION
     025046  070026                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     025050  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     025052  070102                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     025054  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     025062  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     025066  025220                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

4008 025070  032737  020000  177746             BIT     #VSIU,CCR       ;IS SET A BEING USED?
4009 025076  001407                             BEQ     1$              ;YES
4010 025100  052737  000400  177746             BIS     #FC,CCR         ;NO,FLUSH CACHE FOR SET A
4011 025106  032737  010000  177746  200$:      BIT     #VCIP,CCR       ;WAIT TILL FLUSH COMPLETE
4012 025114  001374                             BNE     200$
4013 025116  012700  000002             1$:     MOV     #2,R0           ;DATA TO R0
4014 025122  005001                             CLR     R1              ;ADDRESS 0 TO R1
4015 025124  012737  000015  177746             MOV     #15,CCR         ;NO UCB SO AS TO ENABLE CACHE STORES
4016 025132  112737  000002  177750             MOVB    #HODO,CMR       ;HODO ALLOWS READ UPDATES,AND VALID
4017                                                                    ;STORE DATA TO BE WRITTEN TO CMR <12>
4018                                                                    ;ONLY DURING THE DESTINATION ACCESS
4019                                                                    ;OF AN INSTRUCTION.
4020 025140  005737  040000                     TST     40000           ;
4021 025144  005711                             TST     (R1)            ;READ UPDATE TO CACHE LOCATION 0000.
4022                                                                    ;WRITE 1 INTO VALID STORE LOCATION 0000.
4023 025146  052737  001000  177746             BIS     #UCB,CCR        ;BYPASS MODE
4024 025154  010011                             MOV     R0,(R1)         ;WRITE HIT BYPASS TO LOC. 0 SHOULD INVALIDATE
4025 025156  005711                             TST     (R1)            ;LOAD VALID STORE LOCATION 0000 DATA
4026                                                                    ;RESULTING FROM PREVIOUS WRITE HIT/BYPASS INTO CMR<12>.
4027 025160  013702  177750                     MOV     CMR,R2          ;SAVE CMR CONTENTS
4028 025164  012737  001015  177746             MOV     #OFF,CCR        ;DISABLE CACHE
4029 025172  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     025174  000240                             NOP                     ;FOR  LOOP ON ERROR
4030 025176 .105037  177750                     CLRB    CMR             ;DISABLE MAINTENANCE MODE
4031 025202  032702  010000                     BIT     #VLD,R2         ;CHECK FOR 0
4032 025206  001403                             BEQ     10$             ;PASS
4033 025210  104406                             ERROR                   ;ERROR
                                                                        ;-----
     025212  025210                             .WORD   .-2
4034                                                                    ;WRITE CONTROL LOGIC TESTS
4035                                                                    ;WRITE HIT /BYPASS DID NOT INVALIDATE
4036                                                                    ;CACHE VALID STORE LOCATION
4037 025214  000000                             .WORD   0
4038 025216  000240                     10$:    NOP                     ;END OF TEST
     025220  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

TEST # 146 - VERIFY CACHE DATA STORE RAM MEMORY IC'S

```
4053                                    .SBTTL  TEST # 146 - VERIFY CACHE DATA STORE RAM MEMORY IC'S
                                        ;;*****************************************************************
                                        ;*TEST 146 - VERIFY CACHE DATA STORE RAM MEMORY IC'S
                                        ;*      VERIFY CACHE DATA STORE RAM MEMORY IC'S BY PERFORMING A
                                        ;*      MARCH PATTERN TEST TO LOW CACHE AREA OF DATA STORE(LOC. 0000-3777)
                                        ;*      PROCEDURE:  1. WRITE ALL 0'S TO ALL LO CACHE DATA STORE
                                        ;*                     RAMS CORRESPONDING TO LOCATIONS 0000-3777
                                        ;*                  2. READ 0'S FROM ALL LO CACHE RAMS CORRESPONDING
                                        ;*                     TO LOCATION 0000
                                        ;*                  3. WRITE ALL 1'S TO ALL RAMS CORRESPONDING TO LOCATION
                                        ;*                     0000.
                                        ;*                  4. READ 1'S FROM ALL RAMS CORRESPONDING TO LOCATION
                                        ;*                     0000.
                                        ;*                  5. REPEAT SREPS 2 THRU 4 WITH NEXT LOCATION
                                        ;*                     AND UNTIL LOC. 3777 IS REACHED.
                                        ;;*****************************************************************
     025224
4054 025224  000004                    TST146:
                                               SCPCND                   ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     025226  025236                            .WORD   40$              ;TEST START LOCATION
     025230  070000                            .WORD   1$-40$+67764     ;LOOP ON ERROR START LOCATION
     025232  000000                            .WORD   0                ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     025234  070100                            .WORD   25$-40$+67764    ;LOOP ON ERROR END LOCATION
     025236  012737  001015  177746  40$:      MOV     #OFF,CCR         ;DISABLE CACHE
     025244  004437  002370                    JSR     R4,RELCTH        ;LOCATE TEST CODE TO HIGH CACHE SPACE
     025250  025540                            .WORD   10$+2            ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

4055 025252  012700  060000            1$:     MOV     #60000,R0        ;ADDRESS LOC. 60000 TO R0
4056 025256  005020                    5$:     CLR     (R0)+            ;CLEAR ALL LOW CACHE MAIN MEMORY
4057 025260  020027  070000                    CMP     R0,#70000        ;DONE?
4058 025264  001374                            BNE     5$               ;NO
4059 025266  012700  060000                    MOV     #60000,R0        ;ADDR. LOC. 60000 TO R0
4060 025272  012701  040000                    MOV     #40000,R1        ;ADDR. LOC. 40000 TO R1
4061 025276  012702  177777                    MOV     #-1,R2           ;R2 CONTAINS ALL 1'S
4062 025302  112737  000002  177750            MOVB    #HODO,CMR        ;HODO ALLOWS CACHE UPDATES &   DATA STORE BITS
4063                                                                    ;TO BE WRITTEN TO CDR<15:0> ONLY DURING
4064                                                                    ;THE DESTINATION MEMORY ACCESS OF AN
4065                                                                    ;INSTRUCTION
4066 025310  012737  000015  177746            MOV     #15,CCR          ;WRITE ENABLE CACHE DATA STORES
4067 025316  005721                    6$:     TST     (R1)+            ;UPDATE ALL LOW CACHE DATA STORE WITH 0'S
4068 025320  005720                            TST     (R0)+            ;
4069 025322  020027  070000                    CMP     R0,#70000        ;DONE?
4070 025326  001373                            BNE     6$               ;NO
4071 025330  012700  060000                    MOV     #60000,R0        ;ADDR. 60000 TO R0
4072 025334  005710                    7$:     TST     (R0)             ;READ HIT TO CACHE DATA STORE LOCATION
4073                                                                    ;SPECIFIED BY R0.CLOCK DATA STORE
4074                                                                    ;BITS INTO CDR<15:0>.SHOULD BE ALL 0'S.
4075 025336  013705  177754                    MOV     CDR,R5           ;SAVE CDR CONTENTS
4076 025342  010210                            MOV     R2,(R0)          ;WRITE HIT CACUSES UPDATE TO CACHE DATA
4077                                                                    ;STORE LOCATION.WRITE ALL 1'S.
4078 025344  005710                            TST     (R0)             ;READ HIT.CLOCK DATA STORE BITS TO
4079                                                                    ;CDR <15:0>.SHOULD BE ALL 1'S.
4080 025346  013703  177754                    MOV     CDR,R3           ;SAVE CDR CONTENTS
4081 025352  000240                    25$:    NOP                      ;INSTRUCTION 'JMP 1$' PLACED HERE
```

TEST # 146 - VERIFY CACHE DATA STORE RAM MEMORY IC'S

```
        025354  000240                          NOP             ;FOR  LOOP ON ERROR
   4082 025356  005705                          TST     R5      ;SHOULD BE ALL 0'S
   4083 025360  001424                          BEQ     8$      ;PASS
   4084 025362  012737  001015  177746          MOV     #OFF,CCR        ;DISABLE CACHE
   4085 025370  105037  177750                  CLRB    CMR             ;CLEAR MAINT. MODE
   4086 025374  005037  047332                  CLR     EXDAT6          ;SPECIFY EXPECTED CACHE DATA STORE DATA
   4087 025400  010537  047330                  MOV     R5,CDR150       ;SPECIFY CACHE DATA STORE DATA READ THRU CDR<15:0>
   4088 025404  010037  047334                  MOV     R0,CA121        ;SPECIFY FAILED DATA STORE ADDRESS LOCATION
   4089 025410  006237  047334                  ASR     CA121
   4090 025414  104406                          ERROR                   ;ERROR
                                                                        ;-----
        025416  025414                          .WORD   .-2
   4091                                                                 ;DATA STORE MARCH PATTERN TEST
   4092                                                                 ;READING CACHE DATA STORE DATA
   4093                                                                 ;THRU CDR<15:0> DID NOT READ ALL 0'S.
   4094                                                                 ;THIS SUGGESTS THAT A RAM LOCATION
   4095                                                                 ;SPECIFIED BY CA121 WAS OVERWRITTEN
   4096                                                                 ;WITH A 1 WHEN WRITING A 1 TO ANOTHER
   4097                                                                 ;LOCATION.ANY BIT IN CDR150 DATA
   4098                                                                 ;THAT IS A 1 MAY POINT TO A BAD
   4099                                                                 ;CACHE DATA STORE RAM.
   4100 025420  047332                          EXDAT6                  ; EXPECTED CACHE DATA STORE DATA
   4101 025422  047330                          CDR150                  ; CACHE DATA STORE DATA READ
   4102                                                                 ;THRU CDR<15:0>
   4103 025424  047334                          CA121                   ;SPECIFY FAILED DATA STORE ADDRESS LOCATION
   4104 025426  000000                          .WORD   0
   4105 025430  000435                          BR      3$              ;END THE TEST
   4106 025432  022703  177777          8$:     CMP     #-1,R3          ;SHOULD BE ALL 1'S
   4107 025436  001425                          BEQ     9$              ;PASS
   4108 025440  012737  001015  177746          MOV     #OFF,CCR        ;DISABLE CACHE
   4109 025446  105037  177750                  CLRB    CMR             ;CLEAR MAINT. MODE
   4110 025452  012737  177777  047332          MOV     #-1,EXDAT6      ;SPECIFY EXPECTED CACHE DATA STORE DATA
   4111 025460  010337  047330                  MOV     R3,CDR150       ;SPECIFY CACHE DATA STORE DATA READ
   4112                                                                 ;THRU CDR<15:0>
   4113 025464  010037  047334                  MOV     R0,CA121        ;SPECIFY FAILED DATA STORE ADDRESS LOCATION
   4114 025470  006237  047334                  ASR     CA121
   4115 025474  104406                          ERROR                   ;ERROR
                                                                        ;-----
        025476  025474                          .WORD   .-2
   4116                                                                 ;DATA STORE MARCH PATTERN TEST
   4117                                                                 ;READING CACHE DATA STORE DATA
   4118                                                                 ;THRU CDR<15:0> DID NOT READ ALL 1'S.
   4119                                                                 ;ANY BIT IN CDR150 DATA
   4120                                                                 ;THAT IS A 0 MAY POINT TO A BAD
   4121                                                                 ;CACHE DATA STORE RAM.
   4122
   4123 025500  047332                          EXDAT6                  ; EXPECTED CACHE DATA STORE DATA
   4124 025502  047330                          CDR150                  ; CACHE DATA STORE DATA READ
   4125                                                                 ;THRU CDR<15:0>
   4126 025504  047334                          CA121                   ;SPECIFY FAILED DATA STORE ADDRESS LOCATION
   4127 025506  000000                          .WORD   0
   4128 025510  000405                          BR      3$              ;END TEST
   4129 025512  062700  000002          9$:     ADD     #2,R0           ;NEXT LOCATION
   4130 025516  022700  070000                  CMP     #70000,R0       ;HAS ALL LO CACHE BEEN DONE?
   4131 025522  001304                          BNE     7$              ;NO,CONTINUE
   4132 025524  012737  001015  177746  3$:     MOV     #OFF,CCR        ;DISABLE CACHE
   4133 025532  105037  177750                  CLRB    CMR             ;DISABLE MAINT. MODE
```

TEST # 146 - VERIFY CACHE DATA STORE RAM MEMORY IC'S

```
   4134 025536  000240                    10$:    NOP                         ;END OF TEST
        025540  005237  001472                    INC     $TESTN              ;INCREMENT TEST COUNTER
```

```
                                        .SBTTL  TEST # 147 - VERIFY CACHE DATA STORE RAM MEMORY IC'S
                                        ;;*****************************************************************
                                        ;*TEST 147 - VERIFY CACHE DATA STORE RAM MEMORY IC'S
                                        ;*      VERIFY CACHE DATA STORE RAM MEMORY IC'S BY PERFORMING A
                                        ;*      MARCH PATTERN TEST TO HIGH CACHE AREA OF DATA STORE(LOC. 4000-7777)
                                        ;*      PROCEDURE:  1. WRITE ALL 0'S TO ALL HI CACHE DATA STORE
                                        ;*                     RAMS CORRESPONDING TO LOCATIONS 4000-7777
                                        ;*                  2. READ 0'S FROM ALL HI CACHE RAMS CORRESPONDING
                                        ;*                     TO LOCATION 4000
                                        ;*                  3. WRITE ALL 1'S TO ALL RAMS CORRESPONDING TO LOCATION
                                        ;*                     4000.
                                        ;*                  4. READ 1'S FROM ALL RAMS CORRESPONDING TO LOCATION
                                        ;*                     4000.
                                        ;*                  5. REPEAT SREPS 2 THRU 4 WITH NEXT LOCATION
                                        ;*                     AND UNTIL LOC. 7777 IS REACHED.
                                        ;;*****************************************************************
     025544
4150 025544  000004                    TST147:
                                               SCPCND                   ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     025546  025556                            .WORD   40$              ;TEST START LOCATION
     025550  060000                            .WORD   1$-40$+57764     ;LOOP ON ERROR START LOCATION
     025552  000000                            .WORD   0                ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     025554  060100                            .WORD   25$-40$+57764    ;LOOP ON ERROR END LOCATION
     025556  012737  001015  177746  40$:      MOV     #OFF,CCR         ;DISABLE CACHE
     025564  004437  002342                    JSR     R4,RELCTL        ;LOCATE TEST CODE TO LOW CACHE SPACE
     025570  026060                            .WORD   10$+2            ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO LOW CACHE SPACE

4151 025572  012700  070000            1$:     MOV     #70000,R0        ;ADDRESS LOC. 70000 TO R0
4152 025576  005020                    5$:     CLR     (R0)+            ;CLEAR ALL HIGH CACHE MAIN MEMORY
4153 025600  020027  100000                    CMP     R0,#100000       ;DONE?
4154 025604  001374                            BNE     5$               ;NO
4155 025606  012700  070000                    MOV     #70000,R0        ;ADDR. LOC. 70000 TO R0
4156 025612  012701  050000                    MOV     #50000,R1        ;ADDR. LOC. 50000 TO R1
4157 025616  012702  177777                    MOV     #-1,R2           ;R2 CONTAINS ALL 1'S
4158 025622  112737  000002  177750            MOVB    #HODO,CMR        ;HODO ALLOWS CACHE UPDATES &   DATA STORE BITS
4159                                                                    ;TO BE WRITTEN TO CDR<15:0> ONLY DURING
4160                                                                    ;THE DESTINATION MEMORY ACCESS OF AN
4161                                                                    ;INSTRUCTION
4162 025630  012737  000015  177746            MOV     #15,CCR          ;WRITE ENABLE CACHE DATA STORES
4163 025636  005721                    6$:     TST     (R1)+            ;UPDATE ALL HIGH CACHE DATA STORE WITH 0'S
4164 025640  005720                            TST     (R0)+            ;
4165 025642  020027  100000                    CMP     R0,#100000       ;DONE?
4166 025646  001373                            BNE     6$               ;NO
4167 025650  012700  070000                    MOV     #70000,R0        ;ADDR. 70000 TO R0
4168 025654  005710                    7$:     TST     (R0)             ;READ HIT TO CACHE DATA STORE LOCATION
4169                                                                    ;SPECIFIED BY R0.CLOCK DATA STORE
4170                                                                    ;BITS INTO CDR<15:0>.SHOULD BE ALL 0'S.
4171 025656  013705  177754                    MOV     CDR,R5           ;SAVE CDR CONTENTS
4172 025662  010210                            MOV     R2,(R0)          ;WRITE HIT CACUSES UPDATE TO CACHE DATA
4173                                                                    ;STORE LOCATION.WRITE ALL 1'S.
4174 025664  005710                            TST     (R0)             ;READ HIT.CHICK DATA STORE BITS TO
4175                                                                    ;CDR <15:0>.SHOULD BE ALL 1'S.
4176 025666  013703  177754                    MOV     CDR,R3           ;SAVE CDR CONTENTS
4177 025672  000240                    25$:    NOP                      ;INSTRUCTION 'JMP 1$' PLACED HERE
```

```
TEST # 147 - VERIFY CACHE DATA STORE RAM MEMORY IC'S
        025674  000240                          NOP                     ;FOR  LOOP ON ERROR
   4178 025676  005705                          TST     R5              ;SHOULD BE ALL 0'S
   4179 025700  001424                          BEQ     8$              ;PASS
   4180 025702  012737  001015  177746          MOV     #OFF,CCR        ;DISABLE CACHE
   4181 025710  105037  177750                  CLRB    CMR             ;CLEAR MAINT. MODE
   4182 025714  005037  047332                  CLR     EXDAT6          ;SPECIFY EXPECTED CACHE DATA STORE DATA
   4183 025720  010537  047330                  MOV     R5,CDR150       ;SPECIFY CACHE DATA STORE DATA READ
   4184                                                                 ;THRU CDR<15:0>
   4185 025724  010037  047334                  MOV     R0,CA121        ;SPECIFY FAILED DATA STORE ADDRESS LOCATION
   4186 025730  006237  047334                  ASR     CA121
   4187 025734  104406                          ERROR                   ;ERROR
                                                                        ;-----
        025736  025734                          .WORD   .-2
   4188                                                                 ;DATA STORE MARCH PATTERN TEST
   4189                                                                 ;READING CACHE DATA STORE DATA
   4190                                                                 ;THRU CDR<15:0> DID NOT READ ALL 0'S.
   4191                                                                 ;THIS SUGGESTS THAT A RAM LOCATION
   4192                                                                 ;SPECIFIED BY CA121 WAS OVERWRITTEN
   4193                                                                 ;WITH A 1 WHEN WRITING A 1 TO ANOTHER
   4194                                                                 ;LOCATION.ANY BIT IN CDR150 DATA
   4195                                                                 ;THAT IS A 1 MAY POINT TO A BAD
   4196                                                                 ;CACHE DATA STORE RAM.
   4197
   4198 025740  047332                  EXDAT6                          ; EXPECTED CACHE DATA STORE DATA
   4199 025742  047330                  CDR150                          ; CACHE DATA STORE DATA READ
   4200                                                                 ;THRU CDR<15:0>
   4201 025744  047334                  CA121                           ;SPECIFY FAILED DATA STORE ADDRESS LOCATION
   4202 025746  000000                  .WORD   0
   4203 025750  000435                  BR      3$                      ;END THE TEST
   4204 025752  022703  177777  8$:     CMP     #-1,R3                  ;SHOULD BE ALL 1'S
   4205 025756  001425                  BEQ     9$                      ;PASS
   4206 025760  012737  001015  177746  MOV     #OFF,CCR                ;DISABLE CACHE
   4207 025766  105037  177750          CLRB    CMR                     ;CLEAR MAINT. MODE
   4208 025772  012737  177777  047332  MOV     #-1,EXDAT6              ;SPECIFY EXPECTED CACHE DATA STORE DATA
   4209 026000  010337  047330          MOV     R3,CDR150               ;SPECIFY CACHE DATA STORE DATA READ
   4210                                                                 ;THRU CDR<15:0>
   4211 026004  010037  047334          MOV     R0,CA121                ;SPECIFY FAILED DATA STORE ADDRESS LOCATION
   4212 026010  006237  047334          ASR     CA121
   4213 026014  104406                  ERROR                           ;ERROR
                                                                        ;-----
        026016  026014                  .WORD   .-2
   4214                                                                 ;DATA STORE MARCH PATTERN TEST
   4215                                                                 ;READING CACHE DATA STORE DATA
   4216                                                                 ;THRU CDR<15:0> DID NOT READ ALL 1'S.
   4217                                                                 ;ANY BIT IN CDR150 DATA
   4218                                                                 ;THAT IS A 0 MAY POINT TO A BAD
   4219                                                                 ;CACHE DATA STORE RAM.
   4220
   4221 026020  047332                  EXDAT6                          ; EXPECTED CACHE DATA STORE DATA
   4222 026022  047330                  CDR150                          ; CACHE DATA STORE DATA READ
   4223                                                                 ;THRU CDR<15:0>
   4224 026024  047334                  CA121                           ;SPECIFY FAILED DATA STORE ADDRESS LOCATION
   4225 026026  000000                  .WORD   0
   4226 026030  000405                  BR      3$                      ;END TEST
   4227 026032  062700  000002  9$:     ADD     #2,R0                   ;NEXT LOCATION
   4228 026036  022700  100000          CMP     #100000,R0              ;HAS ALL HI CACHE BEEN DONE?
   4229 026042  001304                  BNE     7$                      ;NO,CONTINUE
```

TEST # 147 - VERIFY CACHE DATA STORE RAM MEMORY IC'S

```
4230 026044  012737  001015  177746  3$:     MOV     #OFF,CCR        ;DISABLE CACHE
4231 026052  105037  177750                  CLRB    CMR             ;DISABLE MAINT. MODE
4232 026056  000240                  10$:    NOP                     ;END OF TEST
     026060  005237  001472                  INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 150 - VERIFY CACHE TAG STORE RAM MEMORY IC'S
                                ;;*****************************************************************
                                ;*TEST 150 - VERIFY CACHE TAG STORE RAM MEMORY IC'S
                                ;*      VERIFY CACHE TAG STORE RAM MEMORY IC'S BY PERFORMING A
                                ;*      MARCH PATTERN TEST TO LOW CACHE AREA OF TAG STORE(LOC. 0000-3777)
                                ;*      PROCEDURE:  1. WRITE ALL 0'S TO ALL LO CACHE TAG STORE
                                ;*                     RAMS CORRESPONDING TO LOCATIONS 0000-3777
                                ;*                  2. READ 0'S FROM ALL LO CACHE RAMS CORRESPONDING
                                ;*                     TO LOCATION 0000
                                ;*                  3. WRITE ALL 1'S TO ALL RAMS CORRESPONDING TO LOCATION
                                ;*                     0000.
                                ;*                  4. READ 1'S FROM ALL RAMS CORRESPONDING TO LOCATION
                                ;*                     0000.
                                ;*                  5. REPEAT SREPS 2 THRU 4 WITH NEXT LOCATION
                                ;*                     AND UNTIL LOC. 3777 IS REACHED.
                                ;;*****************************************************************
     026064                     TST150:
4248 026064  000004                     SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                ;ERROR/LOOP ON TEST
     026066  026076                     .WORD   40$             ;TEST START LOCATION
     026070  070000                     .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     026072  000000                     .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     026074  070070                     .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     026076  012737  001015  177746 40$: MOV     #OFF,CCR        ;DISABLE CACHE
     026104  004437  002370             JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     026110  026454                     .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO HI CACHE SPACE

4249 026112  005037  177752     1$:     CLR     CHR             ;LOAD AMR<8:0> BY WRITING ALL 0'S TO CHR<8:0>
4250 026116  012700  060000             MOV     #60000,R0       ;ADDR. LOC. 60000 TO R0
4251 026122  012701  040000             MOV     #40000,R1       ;ADDR. LOC. 40000 TO R1
4252 026126  112737  000003  177750     MOVB    #HODO+TDAR,CMR  ;HODO ALLOWS CACHE UPDATES &   TAG STORE BITS
4253                                                            ;TO BE WRITTEN TO CHR<15:7> ONLY DURING
4254                                                            ;THE DESTINATION MEMORY ACCESS OF AN INSTRUCTION
4255                                                            ;TDAR ALLOWS TAG FIELD TO BE WRITTEN INTO FROM AMR<8:0>
4256 026134  012737  000015  177746     MOV     #15,CCR         ;WRITE ENABLE CACHE TAG STORES
4257 026142  005721             6$:     TST     (R1)+           ;WRITE ALL LOW CACHE TAG STORE WITH 0'S
4258 026144  005720                     TST     (R0)+           ;
4259 026146  020027  070000             CMP     R0,#70000       ;DONE?
4260 026152  001373                     BNE     6$              ;NO
4261 026154  012737  177777  177752     MOV     #-1,CHR         ;LOAD AMR<8:0> BY WRITING TO CHR<8:0>
4262 026162  012700  060000             MOV     #60000,R0       ;ADDR. 60000 TO R0
4263 026166  005710             7$:     TST     (R0)            ;READ MISS TO CACHE TAG STORE LOCATION
4264                                                            ;SPECIFIED BY R0.CLOCK TAG STORE
4265                                                            ;BITS INTO CHR<15:7>.SHOULD BE ALL 0'S.
4266                                                            ;ALSO CAUSES TAG STORE LOCATION TO BE
4267                                                            ;WRITTEN WITH 1'S FROM AMR<8:0>
4268 026170  013705  177752             MOV     CHR,R5          ;SAVE CHR CONTENTS
4269 026174  005710                     TST     (R0)            ;READ MISS.CLOCK TAG STORE BITS TO
4270                                                            ;CHR <15:0>.SHOULD BE ALL 1'S.
4271 026176  013703  177752             MOV     CHR,R3          ;SAVE CHR CONTENTS
4272 026202  000240             25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     026204  000240                     NOP                     ;FOR  LOOP ON ERROR
4273 026206  042705  000177             BIC     #177,R5
4274 026212  005705                     TST     R5              ;SHOULD BE ALL 0'S
```

```
TEST # 150 - VERIFY CACHE TAG STORE RAM MEMORY IC'S
   4275 026214  001437                        BEQ     8$                ;PASS
   4276 026216  012737  001015  177746        MOV     #OFF,CCR          ;DISABLE CACHE
   4277 026224  105037  177750                CLRB    CMR               ;CLEAR MAINT. MODE
   4278 026230  005037  047350                CLR     EXDAT3            ;SPECIFY EXPECTED CACHE TAG STORE DATA
   4279 026234  010537  047322                MOV     R5,CHR157         ;SPECIFY CACHE TAG STORE TAG READ
   4280                                                                  ;THRU CHR<15:7>
   4281 026240  012737  000007  002062        MOV     #7,LOOP           ;PREPARE CHR157 FOR TYPEOUT
   4282 026246  006237  047322        4$:     ASR     CHR157
   4283 026252  042737  100000  047322        BIC     #100000,CHR157
   4284 026260  005337  002062                DEC     LOOP
   4285 026264  001370                        BNE     4$
   4286 026266  010037  047334                MOV     R0,CA121          ;SPECIFY FAILED TAG STORE ADDRESS LOCATION
   4287 026272  006237  047334                ASR     CA121
   4288 026276  104406                        ERROR                     ;ERROR
                                                                        ;-----
        026300  026276                        .WORD   .-2
   4289                                                                 ;TAG STORE MARCH PATTERN TEST
   4290                                                                 ;READING CACHE TAG STORE DATA
   4291                                                                 ;THRU CHR<15:7> DID NOT READ ALL 0'S.
   4292                                                                 ;THIS SUGGESTS THAT A RAM LOCATION
   4293                                                                 ;SPECIFIED BY CA121 WAS OVERWRITTEN
   4294                                                                 ;WITH A 1 WHEN WRITING A 1 TO ANOTHER
   4295                                                                 ;LOCATION.ANY BIT IN CHR157 DATA
   4296                                                                 ;THAT IS A 1 MAY POINT TO A BAD
   4297                                                                 ;CACHE TAG STORE RAM.
   4298
   4299 026302  047350                        EXDAT3                    ; EXPECTED CACHE TAG STORE DATA
   4300 026304  047322                        CHR157                    ; CACHE TAG STORE DATA READ
   4301                                                                  ;THRU CHR<15:7>
   4302 026306  047334                        CA121                     ;SPECIFY FAILED TAG STORE ADDRESS LOCATION
   4303 026310  000000                        .WORD   0
   4304 026312  000452                        BR      3$                ;END THE TEST
   4305 026314  042703  000177        8$:     BIC     #177,R3           ;PREPARE R3 FOR CHECK
   4306 026320  022703  177600                CMP     #177600,R3        ;SHOULD BE ALL 1'S
   4307 026324  001440                        BEQ     9$                ;PASS
   4308 026326  012737  001015  177746        MOV     #OFF,CCR          ;DISABLE CACHE
   4309 026334  105037  177750                CLRB    CMR               ;CLEAR MAINT. MODE
   4310 026340  012737  177777  047350        MOV     #-1,EXDAT3        ;SPECIFY EXPECTED CACHE TAG STORE DATA
   4311 026346  010337  047322                MOV     R3,CHR157         ;SPECIFY CACHE TAG STORE DATA READ THRU CHR<15:7>
   4312 026352  012737  000007  002062        MOV     #7,LOOP           ;PREPARE CHR157 FOR TYPEOUT
   4313 026360  006237  047322        5$:     ASR     CHR157
   4314 026364  042737  100000  047322        BIC     #100000,CHR157
   4315 026372  005337  002062                DEC     LOOP
   4316 026376  001370                        BNE     5$
   4317 026400  010037  047334                MOV     R0,CA121          ;SPECIFY FAILED TAG STORE ADDRESS LOCATION
   4318 026404  006237  047334                ASR     CA121
   4319 026410  104406                        ERROR                     ;ERROR
                                                                        ;-----
        026412  026410                        .WORD   .-2
   4320                                                                 ;TAG STORE MARCH PATTERN TEST
   4321                                                                 ;READING CACHE TAG STORE DATA
   4322                                                                 ;THRU CHR<15:7> DID NOT READ ALL 15'S.
   4323                                                                 ;ANY BIT IN CHR157 DATA
   4324                                                                 ;THAT IS A 0 MAY POINT TO A BAD
   4325                                                                 ;CACHE TAG STORE RAM.
   4326
   4327 026414  047350                        EXDAT3                    ; EXPECTED CACHE TAG STORE DATA
```

TEST # 150 - VERIFY CACHE TAG STORE RAM MEMORY IC'S

```
4328                                                                    ; CACHE TAG STORE DATA READ
4329                                                                    ;THRU CHR<15:7>
4330 026416  047322                          CHR157                     ;CACHE TAG STORE READ THRU CHR<15:7>
4331 026420  047334                          CA121                      ;SPECIFY FAILED TAG STORE ADDRESS LOCATION
4332 026422  000000                          .WORD   0
4333 026424  000405                          BR      3$                 ;END TEST
4334 026426  062700  000002          9$:     ADD     #2,R0              ;NEXT LOCATION
4335 026432  022700  070000                  CMP     #70000,R0          ;HAS ALL LO CACHE BEEN DONE?
4336 026436  001253                          BNE     7$                 ;NO,CONTINUE
4337 026440  012737  001015  177746  3$:     MOV     #OFF,CCR           ;DISABLE CACHE
4338 026446  105037  177750                  CLRB    CMR                ;DISABLE MAINT. MODE
4339 026452  000240                  10$:    NOP                        ;END OF TEST
     026454  005237  001472                  INC     $TESTN             ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 151 - VERIFY CACHE TAG STORE RAM MEMORY IC'S
                                ;;*****************************************************************
                                ;*TEST 151 - VERIFY CACHE TAG STORE RAM MEMORY IC'S
                                ;*      VERIFY CACHE TAG STORE RAM MEMORY IC'S BY PERFORMING A
                                ;*      MARCH PATTERN TEST TO HIGH CACHE AREA OF TAG STORE(LOC. 4000-7777)
                                ;*      PROCEDURE:  1. WRITE ALL 0'S TO ALL HI CACHE TAG STORE
                                ;*                     RAMS CORRESPONDING TO LOCATIONS 4000-7777
                                ;*                  2. READ 0'S FROM ALL HI CACHE RAMS CORRESPONDING
                                ;*                     TO LOCATION 4000
                                ;*                  3. WRITE ALL 1'S TO ALL RAMS CORRESPONDING TO LOCATION
                                ;*                     4000.
                                ;*                  4. READ 1'S FROM ALL RAMS CORRESPONDING TO LOCATION
                                ;*                     4000.
                                ;*                  5. REPEAT SREPS 2 THRU 4 WITH NEXT LOCATION
                                ;*                     AND UNTIL LOC. 7777 IS REACHED.
                                ;;*****************************************************************
     026460
4355 026460  000004            TST151: SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                ;ERROR/LOOP ON TEST
     026462  026472                     .WORD   40$            ;TEST START LOCATION
     026464  060000                     .WORD   1$-40$+57764   ;LOOP ON ERROR START LOCATION
     026466  000000                     .WORD   0              ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     026470  060070                     .WORD   25$-40$+57764  ;LOOP ON ERROR END LOCATION
     026472  012737  001015  177746 40$: MOV     #OFF,CCR       ;DISABLE CACHE
     026500  004437  002342             JSR     R4,RELCTL      ;LOCATE TEST CODE TO LOW CACHE SPACE
     026504  027050                     .WORD   10$+2          ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO LOW CACHE SPACE

4356 026506  005037  177752     1$:     CLR     CHR            ;LOAD AMR<8:0> BY WRITING ALL 0'S TO CHR<8:0>
4357 026512  012700  070000             MOV     #70000,R0      ;ADDR. LOC. 70000 TO R0
4358 026516  012701  050000             MOV     #50000,R1      ;ADDR. LOC. 50000 TO R1
4359 026522  112737  000003  177750     MOVB    #HODO+TDAR,CMR ;HODO ALLOWS CACHE UPDATES &   TAG STORE BITS
4360                                                            ;TO BE WRITTEN TO CHR<15:7> ONLY DURING
4361                                                            ;THE DESTINATION MEMORY ACCESS OF AN INSTRUCTION
4362                                                            ;TDAR ALLOWS TAG FIELD TO BE WRITTEN INTO FROM AMR<8:0>
4363 026530  012737  000015  177746     MOV     #15,CCR        ;WRITE ENABLE CACHE TAG STORES
4364 026536  005721             6$:     TST     (R1)+          ;WRITE ALL HIGH CACHE TAG STORE WITH 0'S
4365 026540  005720                     TST     (R0)+          ;
4366 026542  020027  100000             CMP     R0,#100000     ;DONE?
4367 026546  001373                     BNE     6$             ;NO
4368 026550  012737  177777  177752     MOV     #-1,CHR        ;LOAD AMR<8:0> BY WRITING TO CHR<8:0>
4369 026556  012700  070000             MOV     #70000,R0      ;ADDR. 70000 TO R0
4370 026562  005710             7$:     TST     (R0)           ;READ MISS TO CACHE TAG STORE LOCATION
4371                                                            ;SPECIFIED BY R0.CLOCK TAG STORE
4372                                                            ;BITS INTO CHR<15:7>.SHOULD BE ALL 0'S.
4373                                                            ;ALSO CAUSES TAG STORE LOCATION TO BE
4374                                                            ;WRITTEN WITH 1'S FROM AMR<8:0>
4375 026564  013705  177752             MOV     CHR,R5         ;SAVE CHR CONTENTS
4376 026570  005710                     TST     (R0)           ;READ MISS.CLOCK TAG STORE BITS TO
4377                                                            ;CHR <15:7>.SHOULD BE ALL 1'S.
4378 026572  013703  177752             MOV     CHR,R3         ;SAVE CHR CONTENTS
4379 026576  000240             25$:    NOP                    ;INSTRUCTION 'JMP 1$' PLACED HERE
     026600  000240                     NOP                    ;FOR  LOOP ON ERROR
4380 026602  042705  000177             BIC     #177,R5
4381 026606  005705                     TST     R5             ;SHOULD BE ALL 0'S
```

TEST # 151 - VERIFY CACHE TAG STORE RAM MEMORY IC'S

```
4382 026610  001437                        BEQ     8$                ;PASS
4383 026612  012737  001015  177746        MOV     #OFF,CCR          ;DISABLE CACHE
4384 026620  105037  177750                CLRB    CMR               ;CLEAR MAINT. MODE
4385 026624  005037  047350                CLR     EXDAT3            ;SPECIFY EXPECTED CACHE TAG STORE DATA
4386 026630  010537  047322                MOV     R5,CHR157         ;SPECIFY CACHE TAG STORE TAG READ
4387                                                                  ;THRU CHR<15:7>
4388 026634  012737  000007  002062        MOV     #7,LOOP           ;PREPARE CHR157 FOR TYPEOUT
4389 026642  006237  047322          4$:   ASR     CHR157
4390 026646  042737  100000  047322        BIC     #100000,CHR157
4391 026654  005337  002062                DEC     LOOP
4392 026660  001370                        BNE     4$
4393 026662  010037  047334                MOV     R0,CA121          ;SPECIFY FAILED TAG STORE ADDRESS LOCATION
4394 026666  006237  047334                ASR     CA121
4395 026672  104406                        ERROR                     ;ERROR
                                                                      ;-----
     026674  026672                        .WORD   .-2
4396                                                                  ;TAG STORE MARCH PATTERN TEST
4397                                                                  ;READING CACHE TAG STORE DATA
4398                                                                  ;THRU CHR<15:7> DID NOT READ ALL 0'S.
4399                                                                  ;THIS SUGGESTS THAT A RAM LOCATION
4400                                                                  ;SPECIFIED BY CA121 WAS OVERWRITTEN
4401                                                                  ;WITH A 1 WHEN WRITING A 1 TO ANOTHER
4402                                                                  ;LOCATION.ANY BIT IN CHR157 DATA
4403                                                                  ;THAT IS A 1 MAY POINT TO A BAD
4404                                                                  ;CACHE TAG STORE RAM.
4405
4406 026676  047350                EXDAT3                            ; EXPECTED CACHE TAG STORE DATA
4407 026700  047322                CHR157                            ; CACHE TAG STORE DATA READ
4408                                                                  ;THRU CHR<15:7>
4409 026702  047334                CA121                             ;SPECIFY FAILED TAG STORE ADDRESS LOCATION
4410 026704  000000                .WORD   0
4411 026706  000452                BR      3$                        ;END THE TEST
4412 026710  042703  000177          8$:   BIC     #177,R3           ;PREPARE R3 FOR CHECK
4413 026714  022703  177600                CMP     #177600,R3        ;SHOULD BE ALL 1'S
4414 026720  001440                        BEQ     9$                ;PASS
4415 026722  012737  001015  177746        MOV     #OFF,CCR          ;DISABLE CACHE
4416 026730  105037  177750                CLRB    CMR               ;CLEAR MAINT. MODE
4417 026734  012737  177777  047350        MOV     #-1,EXDAT3        ;SPECIFY EXPECTED CACHE TAG STORE DATA
4418 026742  010337  047322                MOV     R3,CHR157         ;SPECIFY CACHE TAG STORE DATA READ THRU CHR<15:7>
4419 026746  012737  000007  002062        MOV     #7,LOOP           ;PREPARE CHR157 FOR TYPEOUT
4420 026754  006237  047322          5$:   ASR     CHR157
4421 026760  042737  100000  047322        BIC     #100000,CHR157
4422 026766  005337  002062                DEC     LOOP
4423 026772  001370                        BNE     5$
4424 026774  010037  047334                MOV     R0,CA121          ;SPECIFY FAILED TAG STORE ADDRESS LOCATION
4425 027000  006237  047334                ASR     CA121
4426 027004  104406                        ERROR                     ;ERROR
                                                                      ;-----
     027006  027004                        .WORD   .-2
4427                                                                  ;TAG STORE MARCH PATTERN TEST
4428                                                                  ;READING CACHE TAG STORE DATA
4429                                                                  ;THRU CHR<15:7> DID NOT READ ALL 15'S.
4430                                                                  ;ANY BIT IN CHR157 DATA
4431                                                                  ;THAT IS A 0 MAY POINT TO A BAD
4432                                                                  ;CACHE TAG STORE RAM.
4433
4434 027010  047350                EXDAT3                            ; EXPECTED CACHE TAG STORE DATA
```

```
4435                                                                    ; CACHE TAG STORE DATA READ
4436                                                                    ;THRU CHR<15:7>
4437 027012  047322                        CHR157                       ;CACHE TAG STORE READ THRU CHR<15:7>
4438 027014  047334                        CA121                        ;SPECIFY FAILED TAG STORE ADDRESS LOCATION
4439 027016  000000                        .WORD   0
4440 027020  000405                        BR      3$                   ;END TEST
4441 027022  062700  000002          9$:   ADD     #2,R0                ;NEXT LOCATION
4442 027026  022700  100000                CMP     #100000,R0           ;HAS ALL HI CACHE BEEN DONE?
4443 027032  001253                        BNE     7$                   ;NO,CONTINUE
4444 027034  012737  001015  177746  3$:   MOV     #OFF,CCR             ;DISABLE CACHE
4445 027042  105037  177750                CLRB    CMR                  ;DISABLE MAINT. MODE
4446 027046  000240                  10$:  NOP                          ;END OF TEST
     027050  005237  001472                INC     $TESTN               ;INCREMENT TEST COUNTER
```

TEST # 152 - VERIFY THAT BYTE DATA PARITY STORES CAN HOLD A 0

```
                                .SBTTL  TEST # 152 - VERIFY THAT BYTE DATA PARITY STORES CAN HOLD A 0
                                ;;*****************************************************************
                                ;*TEST 152 - VERIFY THAT BYTE DATA PARITY STORES CAN HOLD A 0
                                ;*      VERIFY THAT LOW AND HI BYTE DATA PARITY STORES CAN HOLD A 0 AT DATA
                                ;*      PARITY STORE LOCATION 0000.
                                ;*      PROCEDURE: GENERATE 0'S FROM UPPER AND LOWER BYTE PARITY
                                ;*                 DATA GENERATORS BY PLACING ALL 0'S ON INPUTS.
                                ;*                 ZERO'S WILL THEN BE WRITTEN INTO DATA PARITY STORE
                                ;*                 LOCATION 0000.READ DATA PARITY STORE BITS FROM
                                ;*                 CMR<11:10>
                                ;*               CONDITIONS:INPUTS TO DATA PARITY GEN:
                                ;*                   WRTD<15:0> ALL 0'S
                                ;*                   WWPD(1)= 0
                                ;*                  DATA PARITY STORE ADDRESS:
                                ;*                   CA<12:1>=0000
                                ;*                RESULT:     CMR<11:10> BOTH 0
                                ;;*****************************************************************
     027054                     TST152:
4463 027054  000004                     SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                ;ERROR/LOOP ON TEST
     027056  027066                     .WORD   40$             ;TEST START LOCATION
     027060  070004                     .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     027062  000000                     .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     027064  070040                     .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     027066  012737  001015  177746 40$: MOV     #OFF,CCR        ;DISABLE CACHE
     027074  004437  002370             JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     027100  027212                     .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO HI CACHE SPACE

4464 027102  005037  060000             CLR     60000           ;0'S TO MAIN MEMORY LOCATION
4465 027106  112737  000002  177750 1$: MOVB    #HODO,CMR       ;ALLOWS UPPER AND LOWER BYTE DATA
4466                                                            ;PARITY STORE BITS TO BE WRITTEN TO
4467                                                            ;CMR<11:10> ONLY DURING THE  DESTINATION
4468                                                            ;ACCESS OF AN INSTRUCTION.
4469 027114  012737  000015  177746     MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE PARITY STORE
4470 027122  005737  040000             TST     40000           ;
4471 027126  005737  060000             TST     60000           ;PLACE ALL 0'S ON WRTD<15:0> INPUTS
4472                                                            ;THEREBY WRITING 0 INTO PARITY STORE LOCATION 0000.
4473 027132  005737  060000             TST     60000           ;WRITE UPPER AND LOWER DATA PARITY BITS FROM
4474                                                            ;LOCAT. 0000 INTO CMR<11:10> RESPECTIVELY.
4475 027136  013701  177750             MOV     CMR,R1          ;SAVE CMR DATA
4476 027142  000240                 25$: NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     027144  000240                     NOP                     ;FOR  LOOP ON ERROR
4477 027146  105037  177750             CLRB    CMR             ;DISABLE MAINT. MODE
4478 027152  012737  001015  177746     MOV     #OFF,CCR        ;DISABLE CACHE
4479 027160  032701  004000             BIT     #HPB,R1         ;CHECK FOR 0
4480 027164  001403                     BEQ     9$              ;PASS
4481 027166  104406                     ERROR                   ;ERROR
                                                                ;-----
     027170  027166                     .WORD   .-2
4482                                                            ;DATA PARITY GEN. & STORE TESTS
4483                                                            ;READING CACHE MAINT. REGISTER
4484                                                            ;BIT 11 FOR UPPER BYTE PARITY DATA DID
4485                                                            ;NOT RESULT IN 0.
4486 027172  000000                     .WORD   0
```

TEST # 152 - VERIFY THAT BYTE DATA PARITY STORES CAN HOLD A 0

```
4487 027174  032701  002000          9$:     BIT     #LPB,R1         ;CHECK 0 FOR LOWER BYTE PARITY DATA
4488 027200  001403                         BEQ     10$             ;PASS
4489 027202  104406                         ERROR                   ;ERROR
                                            ;-----
     027204  027202                         .WORD   .-2
4490                                        ;DAT. PARITY GEN. $ STORE TESTS
4491                                        ;READING CACHE MAINT. REGISTER
4492                                        ;BIT 10 FOR LOWER BYTE PARITY DATA DID
4493                                        ;NOT RESULT IN 0.
4494 027206  000000                         .WORD   0
4495 027210  000240                 10$:    NOP                     ;END OF TEST
     027212  005237  001472                 INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
4511                                    .SBTTL  TEST # 153 - CHK THAT LOW BYTE DATA PARITY GEN WRITES A 1
                                        ;;*********************************************************************
                                        ;*TEST 153 - CHK THAT LOW BYTE DATA PARITY GEN WRITES A 1
                                        ;*      VERIFY THAT THE LOW BYTE DATA PARITY GENERATOR WILL WRITE A 1 INTO  ADDRESS LOCATION
                                        ;*      0000 FOR FLOATING 1 ACROSS 0 DATA PATTERN ON DATA PARITY GENERATOR INPUTS.
                                        ;*      PROCEDURE: FOR EACH FLOATING 1 PATTERN READ DATA PARITY STORE BITS
                                        ;*                 FROM CMR<11:10>
                                        ;*      CONDITIONS:
                                        ;*              INPUTS TO DATA PARITY GEN.:
                                        ;*                   WRTD<7:0> FLOATING 1 ACROSS 0'S
                                        ;*                   WRTD<15:8> ALL 0'S
                                        ;*                   WWPD(1)=0
                                        ;*                DATA PARITY STORE ADDRESS:
                                        ;*                   CA<12:1>=0000
                                        ;*      RESULT: CMR<11>=0
                                        ;*              CMR<10>=1
                                        ;;*********************************************************************
     027216                             TST153:
4512 027216  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     027220  027230                             .WORD   40$             ;TEST START LOCATION
     027222  070014                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     027224  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     027226  070050                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     027230  012737  001015  177746  40$:      MOV     #OFF,CCR        ;DISABLE CACHE
     027236  004437  002370                    JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     027242  027404                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

4513 027244  012737  000001  047344            MOV     #1,FLTPAT       ;1ST FLOATING 1 PATTERN:000001
4514 027252  013737  047344  060000  2$:       MOV     FLTPAT,@600U0   ;FLOATING PATTERN TO MAIN MEMORY
4515 027260  112737  000002  177750  1$:       MOVB    #HODO,CMR       ;ALLOWS UPPER AND LOWER BYTE DATA
4516                                            ;PARITY STORE BITS TO BE WRITTEN TO
4517                                            ;CMR<11:10> ONLY DURING THE  DESTINATION
4518                                            ;ACCESS OF AN INSTRUCTION.
4519 027266  012737  000015  177746            MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE PARITY
4520                                            ;STORE
4521 027274  005737  040000                    TST     40000           ;
4522 027300  005737  060000                    TST     60000           ;PLACE FLOATING 1 PATTERN ON WRTD<15:0> INPUTS
4523                                            ;THEREBY WRITING  1 IN LOW BYTE AND 0 IN HI
4524                                            ;BYTE DATA PARITY STORE LOCATION 0000.
4525 027304  005737  060000                    TST     60000           ;WRITE UPPER AND LOWER BYTE DATA PARITY BITS FROM
4526                                            ;LOCAT. 0000 INTO CMR<11:10> RESPECTIVELY.
4527 027310  013701  177750                    MOV     CMR,R1          ;SAVE CMR DATA
4528 027314  000240                    25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     027316  000240                            NOP                     ;FOR  LOOP ON ERROR
4529 027320  105037  177750                    CLRB    CMR             ;DISABLE MAINT. MODE
4530 027324  012737  001015  177746            MOV     #OFF,CCR        ;DISABLE CACHE
4531 027332  032701  004000                    BIT     #HPB,R1         ;CHECK  0 FOR UPPER BYTE PARITY STORE
4532 027336  001404                            BEQ     8$              ;PASS
4533 027340  104406                            ERROR                   ;ERROR
                                                                        ;-----
     027342  027340                            .WORD   .-2
4534                                                                    ;DATA PARITY GEN. & STORE TESTS
4535                                                                    ;READING CACHE MAINT. REGISTER
```

```
4536                                                                    ;BIT 11 FOR UPPER BYTE PARITY DATA DID
4537                                                                    ;NOT RESULT IN 0.
4538 027344  047344                        FLTPAT                      ;PRINT FLOATING 1 PATTERN USED FOR DATA PARITY
4539                                                                    ;GENERATOR INPUTS: WRTD<15:0>
4540 027346  000000                        .WORD   0
4541 027350  032701  002000          8$:    BIT     #LPB,R1             ;CHECK 1 FOR LOWER BYTE PARITY DATA
4542 027354  001004                        BNE     9$                  ;PASS
4543 027356  104406                        ERROR                       ;ERROR
                                                                        ;-----
     027360  027356                        .WORD   .-2
4544                                                                    ;DAT. PARITY GEN. $ STORE TESTS
4545                                                                    ;READING CACHE MAINT. REGISTER
4546                                                                    ;BIT 10 FOR LOWER BYTE PARITY DATA DID
4547                                                                    ;NOT RESULT IN 1.
4548 027362  047344                        FLTPAT                      ;PRINT FLOATING 1 PATTERN USED FOR DATA PARITY
4549                                                                    ;GEN. INPUT: WRTD<15:0>
4550 027364  000000                        .WORD   0
4551 027366  006337  047344          9$:    ASL     FLTPAT              ;NEXT PATTREN
4552 027372  032737  000400  047344        BIT     #400,FLTPAT         ;HAS PATTERN 000200 BEEN DONE
4553 027400  001724                        BEQ     2$                  ;NO
4554 027402  000240                10$:    NOP                         ;END OF TEST
     027404  005237  001472                INC     $TESTN              ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 154 - CHK THAT HI BYTE DATA PARITY GEN WRITES A 1
                                ;;*****************************************************************
                                ;*TEST 154 - CHK THAT HI BYTE DATA PARITY GEN WRITES A 1
                                ;*      VERIFY THAT THE HI BYTE DATA PARITY GENERATOR WILL WRITE A 1 INTO  ADDRESS LOCATION
                                ;*      FOR FLOATING 1 ACROSS 0 DATA PATTERN ON DATA PARITY GENERATOR INPUTS.
                                ;*      PROCEDURE: FOR EACH FLOATING 1 PATTERN READ DATA PARITY STORE BITS
                                ;*                 FROM CMR<11:10>
                                ;*               CONDITIONS:
                                ;*               INPUTS TO DATA PARITY GEN.:
                                ;*                    WRTD<7:0> ALL 0'S
                                ;*                    WRTD<15:8> FLOATING 1 PATTERN
                                ;*                    WWPD(1)=0
                                ;*                 DATA PARITY STORE ADDRESS:
                                ;*                   CA<12:1>=0000
                                ;*               RESULT: CMR<11>=1
                                ;*               CMR<10>=0
                                ;;*****************************************************************
     027410
4571 027410  000004            TST154:
                                        SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                ;ERROR/LOOP ON TEST
     027412  027422                     .WORD   40$             ;TEST START LOCATION
     027414  070014                     .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     027416  000000                     .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     027420  070050                     .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     027422  012737  001015  177746 40$: MOV     #OFF,CCR        ;DISABLE CACHE
     027430  004437  002370             JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     027434  027570                     .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO HI CACHE SPACE

4572 027436  012737  000400  047344      MOV     #400,FLTPAI     ;1ST FLOATING 1 PATTERN:000400
4573 027444  013737  047344  060000 2$:  MOV     FLTPAT,60000    ;FLOATING PATTERN TO MAIN MEMORY
4574 027452  112737  000002  177750 1$:  MOVB    #HODO,CMR       ;ALLOWS UPPER AND LOWER BYTE DATA
4575                                                            ;PARITY STORE BITS TO BE WRITTEN TO
4576                                                            ;CMR<11:10> ONLY DURING THE  DESTINATION
4577                                                            ;ACCESS OF AN INSTRUCTION.
4578 027460  012737  000015  177746      MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE PARITY STORE
4579 027466  005737  040000             TST     40000           ;
4580 027472  005737  060000             TST     60000           ;PLACE FLOATING 1 PATTERN ON WRTD<15:0> INPUTS
4581                                                            ;THEREBY WRITING  0 IN LOW BYTE AND 1  IN HI
4582                                                            ;BYTE DATA PARITY STORE LOCATION 0000.
0000588T02CMR611000073RES060000        TST     60000           ;WRITE UPPER AND LOWER BYTE DATA PARITY BITS FROM

4584 027502  013701  177750             MOV     CMR,R1          ;SAVE CMR DATA
4585 027506  000240            25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     027510  000240                     NOP                     ;FOR  LOOP ON ERROR
4586 027512  105037  177750             CLRB    CMR             ;DISABLE MAINT. MODE
4587 027516  012737  001015  177746     MOV     #OFF,CCR        ;DISABLE CACHE
4588 027524  032701  004000             BIT     #HPB,R1         ;CHECK  1 FOR UPPER BYTE PARITY STORE
4589 027530  001004                     BNE     8$              ;PASS
4590 027532  104406                     ERROR                   ;ERROR
                                                                ;-----
     027534  027532                     .WORD   .-2
```

```
4591                                                    ;DATA PARITY GEN. & STORE TESTS
4592                                                    ;READING CACHE MAINT. REGISTER
4593                                                    ;BIT 11 FOR UPPER BYTE PARITY DATA DID
4594                                                    ;NOT RESULT IN 1.
4595 027536  047344                    FLTPAT          ;PRINT FLOATING 1 PATTERN USED FOR DATA PARITY
4596                                                    ;GENERATOR INPUTS: WRTD<15:0>
4597 027540  000000                    .WORD   0
4598 027542  032701  002000      8$:   BIT     #LPB,R1   ;CHECK 0 FOR LOWER BYTE PARITY DATA
4599 027546  001404                    BEQ     9$        ;PASS
4600 027550  104406                    ERROR             ;ERROR
                                                        ;-----
     027552  027550                    .WORD   .-2
4601                                                    ;DAT. PARITY GEN. $ STORE TESTS
4602                                                    ;READING CACHE MAINT. REGISTER
4603                                                    ;BIT 10 FOR LOWER BYTE PARITY DATA DID
4604                                                    ;NOT RESULT IN 0.
4605 027554  047344                    FLTPAT          ;PRINT FLOATING 1 PATTERN USED FOR DATA PARITY
4606                                                    ;GEN. INPUTS: WRTD<15:0>
4607 027556  000000                    .WORD   0
4608 027560  006337  047344      9$:   ASL     FLTPAT    ;NEXT PATTERN
4609 027564  103327                    BCC     2$        ;CONTINUE IF PATTERN 100000 NOT DONE
4610 027566  000240              10$:  NOP               ;END OF TEST
     027570  005237  001472            INC     $TESTN    ;INCREMENT TEST COUNTER
```

```
 4622                                   .SBTTL  TEST # 155 - VERIFY WRITE WRONG PARITY TO BYTES DATA PARITY
                                        ;;*****************************************************************
                                        ;*TEST 155 - VERIFY WRITE WRONG PARITY TO BYTES DATA PARITY
                                        ;*      VERIFY  WRITE WRONG PARITY TO UPPER AND LOWER BYTE DATA PARITY
                                        ;*      STORE .
                                        ;*      CONDITIONS:
                                        ;*              INPUTS TO DATA PARITY GEN:
                                        ;*                  WRTD<15:0> ALL 0'S
                                        ;*                  WWPD(1)= 1
                                        ;*                DATA PARITY STORE ADDRESS:
                                        ;*                  CA<12:1>=0000
                                        ;*      RESULT:     CMR<11:10> BOTH 1
                                        ;;*****************************************************************
      027574                            TST155:
 4623 027574  000004                            SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
      027576  027606                            .WORD   40$             ;TEST START LOCATION
      027600  070004                            .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
      027602  000000                            .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
      027604  070040                            .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
      027606  012737  001015  177746  40$:      MOV     #OFF,CCR        ;DISABLE CACHE
      027614  004437  002370                    JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
      027620  027750                            .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

 4624 027622  005037  060000                    CLR     60000           ;0'S TO MAIN MEMORY LOCATION
 4625 027626  112737  000002  177750  1$:       MOVB    #HODO,CMR       ;ALLOWS UPPER AND LOWER BYTE DATA
 4626                                                                   ;PARITY STORE BITS TO BE WRITTEN TO
 4627                                                                   ;CMR<11:10> ONLY DURING THE  DESTINATION
 4628                                                                   ;ACCESS OF AN INSTRUCTION.
 4629 027634  012737  000115  177746            MOV     #15+WWPD,CLR    ;NO UCB SO AS TO WRITE ENABLE PARITY.
 4630                                                                   ;ENABLE WRITE WRONG PARITY DATA
 4631 027642  005737  040000                    TST     40000           ;
 4632 027646  005737  060000                    TST     60000           ;PLACE ALL 0'S ON WRTD<15:0> INPUTS
 4633                                                                   ;SINCE WWPD IS INVOKED A 1 WILL BE
 4634                                                                   ;WRITTEN INTO PARITY STORE LOCATION 0000.
 4635 027652  005737  060000                    TST     60000           ;WRITE UPPER AND LOWER DATA PARITY BITS FROM
 4636                                                                   ;LOCAT. 0000 INTO CMR<11:10> RESPECTIVELY.
 4637 027656  013701  177750                    MOV     CMR,R1          ;SAVE CMR DATA
 4638 027662  000240            25$:            NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
      027664  000240                            NOP                     ;FOR  LOOP ON ERROR
 4639 027666  012737  001015  177746            MOV     #OFF,CCR        ;DISABLE CACHE
 4640 027674  105037  177750                    CLRB    CMR             ;DISABLE MAINT. MODE
 4641 027700  052737  000400  177746            BIS     #FC,CCR         ;BEFORE LEAVING TEST FLUSH CACHE TO
 4642                                                                   ;REMOVE ANY EFFECTS OF WWPD
 4643 027706  032737  010000  177746  200$:     BIT     #VCIP,CCR       ;WAIT TILL DONE
 4644 027714  001374                            BNE     200$
 4645 027716  032701  004000                    BIT     #HPB,R1         ;CHECK 1 FOR UPPER BYTE PARITY STORE.
 4646 027722  001003                            BNE     9$              ;PASS
 4647 027724  104406                            ERROR                   ;ERROR
                                                                        ;-----
      027726  027724                            .WORD   .-2
 4648                                                                   ;DATA PARITY GEN. & STORE TESTS
 4649                                                                   ;READING CACHE MAINT. REGISTER
 4650                                                                   ;BIT 11 FOR UPPER BYTE PARITY DATA DID
```

```
 4651                                                          ;NOT RESULT IN 1.
 4652 027730  000000                        .WORD   0
 4653 027732  032701  002000          9$:    BIT     #LPB,R1  ;CHECK 1 FOR LOWER BYTE PARITY DATA
 4654 027736  001003                        BNE     10$      ;PASS
 4655 027740  104406                        ERROR            ;ERROR
                                                              ;-----
      027742  027740                        .WORD   .-2
 4656                                                          ;DAT. PARITY GEN. $ STORE TESTS
 4657                                                          ;READING CACHE MAINT. REGISTER
 4658                                                          ;BIT 10 FOR LOWER BYTE PARITY DATA DID
 4659                                                          ;NOT RESULT IN 1.
 4660 027744  000000                        .WORD   0
 4661 027746  000240                  10$:   NOP              ;END OF TEST
      027750  005237  001472                INC     $TESTN   ;INCREMENT TEST COUNTER
```

```
  4677                                  .SBTTL  TEST # 156 - VERIFY THAT TAG  PARITY STORE CAN HOLD A 0
                                        ;;*****************************************************************
                                        ;*TEST 156 - VERIFY THAT TAG  PARITY STORE CAN HOLD A 0
                                        ;*      VERIFY THAT TAG  PARITY STORE CAN HOLD A 0 AT TAG
                                        ;*      PARITY STORE LOCATION 0000.
                                        ;*      PROCEDURE: GENERATE 0 FROM TAG   PARITY
                                        ;*                  GENERATOR BY PLACING ALL 0'S ON INPUTS.
                                        ;*                  ZERO WILL BE WRITTEN  INTO TAG PARITY STORE
                                        ;*                 LOCATION 0000.READ TAG PARITY STORE BIT FROM
                                        ;*                 CMR<9>
                                        ;*      CONDITIONS:INPUTS TO TAG PARITY GEN:
                                        ;*                  TAG WRTD<21:13> ALL 0'S
                                        ;*                  WWPT(1)= 0
                                        ;*                 TAG PARITY STORE ADDRESS:
                                        ;*                  CA<12:1>=0000
                                        ;*      RESULT:     CMR<9>=  0
                                        ;;*****************************************************************
       027754                           TST156:
  4678 027754  000004                           SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                         ;ERROR/LOOP ON TEST
       027756  027766                           .WORD   40$             ;TEST START LOCATION
       027760  070004                           .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
       027762  000000                           .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
       027764  070040                           .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
       027766  012737  001015  177746  40$:     MOV     #OFF,CCR        ;DISABLE CACHE
       027774  004437  002370                   JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
       030000  030076                           .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

  4679 030002  005037  177752                   CLR     CHR             ;LOAD AMR<8:0> BY WRITING ALL 0'S TO CHR<8:0>
  4680 030006  112737  000003  177750  1$:      MOVB    #HODO+TDAR,CMR  ; HODO ALLOWS TAG
  4681                                                                   ;PARITY STORE BIT TO BE WRITTEN TO
  4682                                                                   ;CMR<9> ONLY DURING THE  DESTINATION
  4683                                                                   ;ACCESS OF AN INSTRUCTION.
  4684                                                                   ;TDAR ALLOWS INPUTS TO TAG PARITY STORE
  4685                                                                   ;GENERATOR TO BE LOADED FROM AMR<8:0>
  4686 030014  012737  000015  177746           MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE PARITY
  4687                                                                   ;STORE
  4688 030022  005737  040000                   TST     40000           ;
  4689 030026  005737  060000                   TST     60000           ;PLACE ALL 0'S ON TAG  WRTD<21:13> INPUTS
  4690                                                                   ;THEREBY WRITING 0 INTO PARITY STORE LOCATION 0000.
  4691 030032  005737  060000                   TST     60000           ;WRITE TAG PARITY BITS FROM LOCAT. 0000 INTO CMR<9>
  4692 030036  013701  177750                   MOV     CMR,R1          ;SAVE CMR DATA
  4693 030042  000240                   25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
       030044  000240                           NOP                     ;FOR  LOOP ON ERROR
  4694 030046  105037  177750                   CLRB    CMR             ;DISABLE MAINT. MODE
  4695 030052  012737  001015  177746           MOV     #OFF,CCR        ;DISABLE CACHE
  4696 030060  032701  001000                   BIT     #TPB,R1         ;CHECK FOR 0
  4697 030064  001403                           BEQ     10$             ;PASS
  4698 030066  104406                           ERROR                   ;ERROR
                                                                         ;-----
       030070  030066                           .WORD   .-2
  4699                                                                   ;TAG PARITY GEN. & STORE TESTS
  4700                                                                   ;READING CACHE MAINT. REGISTER
  4701                                                                   ;BIT 9 FOR TAG PARITY DATA DID
```

```
 4702                                                                   ;NOT RESULT IN 0.
 4703 030072  000000                          .WORD   0
 4704 030074  000240                  10$:    NOP                       ;END OF TEST
      030076  005237  001472                  INC     $TESTN            ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 157 - VERIFY THAT TAG PARITY GENERATOR WILL WRITE A 1
                                ;;*****************************************************************
                                ;*TEST 157 - VERIFY THAT TAG PARITY GENERATOR WILL WRITE A 1
                                ;*      VERIFY THAT TAG PARITY GENERATOR WILL WRITE A 1 INTO TAG PARITY STORE
                                ;*      ADDRESS 0000 FOR FLOATING 1 PATTERN ON TAG PARITY GENERATOR INPUTS
                                ;*              PROCEDURE: GENERATE 1 FROM TAG   PARITY
                                ;*                  GENERATOR BY PLACING FLOATING 1 PATTERN ON INPUTS
                                ;*                AND WRITING   1  INTO TAG PARITY STORE
                                ;*                LOCATION 0000.READ TAG PARITY STORE BIT FROM
                                ;*                CMR<9>
                                ;*      CONDITIONS:
                                ;*              INPUTS TO TAG PARITY GEN:
                                ;*                  TAG WRTD<21:13> FLOATING 1 PATTERN
                                ;*                  WWPD(1)= 0
                                ;*                TAG PARITY STORE ADDRESS:
                                ;*                  CA<12:1>=0000
                                ;*      RESULT:     CMR<9>=  1
                                ;;*****************************************************************
      030102                    TST157:
4722  030102  000004                   SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                              ;ERROR/LOOP ON TEST
      030104  030114                   .WORD   40$             ;TEST START LOCATION
      030106  070014                   .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
      030110  000000                   .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
      030112  070050                   .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
      030114  012737  001015  177746  40$:     MOV     #OFF,CCR        ;DISABLE CACHE
      030122  004437  002370                   JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
      030126  030252                   .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO HI CACHE SPACE

4723  030130  012737  000001  047344          MOV     #1,FLTPAT       ;IST FLOATING PATTERN
4724  030136  013737  047344  177752  2$:     MOV     FLTPAT,CHR      ;LOAD AMR<8:0> BY WRITING FLOATING
4725                                          ;PATTERN TO CHR<8:0>.
4726  030144  112737  000003  177750  1$:     MOVB    #HODO+TDAR,CMR  ; HODO ALLOWS TAG
4727                                          ;PARITY STORE BIT TO BE WRITTEN TO
4728                                          ;CMR<9> ONLY DURING THE  DESTINATION
4729                                          ;ACCESS OF AN INSTRUCTION.
4730                                          ;TDAR ALLOWS INPUTS TO TAG PARITY STORE
4731                                          ;GENERATOR TO BE LOADED FROM AMR<8:0>
4732  030152  012737  000015  177746          MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE PARITY
4733                                          ;STORE
4734  030160  005737  040000                  TST     40000           ;
4735  030164  005737  060000                  TST     60000           ;PLACE FLOATING 1 PATTERN ON TAG  WRTD<21:13> INPUTS
4736                                          ;THEREBY WRITING 1 INTO PARITY STORE LOCATION 0000.
4737  030170  005737  060000                  TST     60000           ;WRITE TAG PARITY BIT FROM LOCAT. 0000 INTO CMR<9>
4738  030174  013701  177750                  MOV     CMR,R1          ;SAVE CMR DATA
4739  030200  000240                  25$:     NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
      030202  000240                           NOP                     ;FOR  LOOP ON ERROR
4740  030204  105037  177750                  CLRB    CMR             ;DISABLE MAINT. MODE
4741  030210  012737  001015  177746          MOV     #OFF,CCR        ;DISABLE CACHE
4742  030216  032701  001000                  BIT     #TPB,R1         ;CHECK FOR 1
4743  030222  001004                          BNE     9$              ;PASS
4744  030224  104406                          ERROR                   ;ERROR
                                              ;-----
      030226  030224                   .WORD   .-2
```

TEST # 157 - VERIFY THAT TAG PARITY GENERATOR WILL WRITE A 1

```
 4745                                                                ;TAG PARITY GEN. & STORE TESTS
 4746                                                                ;READING CACHE MAINT. REGISTER
 4747                                                                ;BIT 9 FOR TAG PARITY DATA DID
 4748                                                                ;NOT RESULT IN 1.
 4749 030230  047344                        FLTPAT                   ;PRINT FLOATING 1 PATTERN USED ON
 4750                                                                ;TAG PARITY GEN. INPUTS: TAG WRTD<21:13>
 4751 030232  000000                        .WORD   0
 4752 030234  006337  047344          9$:   ASL     FLTPAT           ;NEXT PATTERN
 4753 030240  032737  001000  047344        BIT     #1000,FLTPAT     ;HAS PATTERN 400 BEEN DONE
 4754 030246  001733                        BEQ     2$               ;NO,CONTINUE
 4755 030250  000240                 10$:   NOP                      ;END OF TEST
      030252  005237  001472                INC     $TESTN           ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 160 - VERIFY WRITE WRONG PARITY TO TAG PARITY STORE
                                ;;*****************************************************************
                                ;*TEST 160 - VERIFY WRITE WRONG PARITY TO TAG PARITY STORE
                                ;*      VERIFY WRITE WRONG PARITY TO TAG PARITY STORE
                                ;*      CONDITIONS:
                                ;*              INPUTS TO TAG PARITY GEN:
                                ;*                  TAG WRTD<21:13> ALL 0'S
                                ;*                  WWPT(1)= 1
                                ;*                 TAG PARITY STORE ADDRESS:
                                ;*                  CA<12:1>=0000
                                ;*      RESULT:     CMR<9>=  1
                                ;;*****************************************************************
     030256                     TST160:
4767 030256  000004                     SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                ;ERROR/LOOP ON TEST
     030260  030270                     .WORD   40$             ;TEST START LOCATION
     030262  070004                     .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     030264  000000                     .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     030266  070040                     .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     030270  012737  001015  177746 40$: MOV     #OFF,CCR        ;DISABLE CACHE
     030276  004437  002370             JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     030302  030416                     .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO HI CACHE SPACE

4768 030304  005037  177752             CLR     CHR             ;LOAD AMR<8:0> WITH 0'S BY WRITING TO CHR<8:0>
4769 030310  112737  000003  177750 1$: MOVB    #HODO+TDAR,CMR  ;HODO   ALLOWS TAG
4770                                                            ;PARITY STORE BITS TO BE WRITTEN TO
4771                                                            ;CMR<9> ONLY DURING THE  DESTINATION
4772                                                            ;ACCESS OF AN INSTRUCTION.
4773                                                            ;TDAR ALLOWS INPUTS TO TAG PARITY GEN.
4774                                                            ;TO BE LOADED FROM AMR<8:0>
4775 030316  012737  002015  177746     MOV     #15+WWPT,CCR    ;NO UCB SO AS TO WRITE ENABLE PARITY.
4776                                                            ;ENABLE WRITE WRONG PARITY TAG
4777 030324  005737  040000             TST     40000           ;
4778 030330  005737  060000             TST     60000           ;PLACE ALL 0'S ON TAG WRTD<20:13> INPUTS
4779                                                            ;SINCE WWPT IS INVOKED A 1 WILL BE
4780                                                            ;WRITTEN INTO PARITY STORE LOCATION 0000.
4781 030334  005737  060000             TST     60000           ;WRITE TAG BIT FROM LOCAT. 0000 INTO CMR<9>
4782 030340  013701  177750             MOV     CMR,R1          ;SAVE CMR DATA
4783 030344  000240                25$: NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     030346  000240                     NOP                     ;FOR  LOOP ON ERROR
4784 030350  012737  001015  177746     MOV     #OFF,CCR        ;DISABLE CACHE
4785 030356  105037  177750             CLRB    CMR             ;DISABLE MAINT. MODE
4786 030362  052737  000400  177746     BIS     #FC,CCR         ;BEFORE LEAVING TEST FLUSH CACHE
4787                                                            ;TO REMOVE ANY EFFECTS OF WWPT
4788 030370  032737  010000  177746 200$: BIT     #VCIP,CCR       ;WAIT TILL DONE
4789 030376  001374                     BNE     200$
4790 030400  032701  001000             BIT     #TPB,R1         ;CHECK 1 FOR TAG PARITY STORE.
4791 030404  001003                     BNE     10$             ;PASS
4792 030406  104406                     ERROR                   ;ERROR
                                                                ;-----
     030410  030406                     .WORD   .-2
```

```
                                                                        ;TAG PARITY GEN. & STORE TESTS
                                                                        ;READING CACHE MAINT. REGISTER
                                                                        ;BIT 9 FOR TAG PARITY DATA DID
                                                                        ;NOT RESULT IN 1.
 4797 030412  000000                        .WORD   0
 4798 030414  000240                 10$:   NOP                         ;END OF TEST
      030416  005237  001472                INC     $TESTN              ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 161 - CLEAR ALL LOW CACHE DATA & TAG PARITY STORES
                                ;;*****************************************************************
                                ;*TEST 161 - CLEAR ALL LOW CACHE DATA & TAG PARITY STORES
                                ;*      WRITE AND READ 0'S TO ALL LOW CACHE DATA PARITY AND TAG PARITY STORES
                                ;*      CONDITIONS:
                                ;*              INPUTS TO DATA PARITY GEN:
                                ;*                  WRTD<15:0> ALL 0'S
                                ;*                  WWPD(1)= 0
                                ;*              INPUTS TO TAG PARITY GEN.:
                                ;*                  TAG WRTD<21:13> ALL 0'S
                                ;*                  WWPT(1)=0
                                ;*                DATA PARITY/TAG PARITY STORE ADDRESS:
                                ;*                  CA<12:1>=0000 TO 3777
                                ;*      RESULT:     CMR<11:9> ALL 0
                                ;;*****************************************************************
     030422
4813 030422  000004                TST161: SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                    ;ERROR/LOOP ON TEST
     030424  030434                        .WORD   40$             ;TEST START LOCATION
     030426  070030                        .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     030430  000000                        .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     030432  070056                        .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     030434  012737  001015  177746  40$:   MOV     #OFF,CCR        ;DISABLE CACHE
     030442  004437  002370                JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     030446  030646                        .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO HI CACHE SPACE

4814 030450  005037  177752            CLR     CHR             ;LOAD AMR<8:0> WITH ALL 0'S
4815 030454  012705  060000            MOV     #60000,R5       ;ADDRESS 60000 TO R5
4816 030460  005025            2$:     CLR     (R5)+           ;CLEAR ALL LOW CACHE MAIN MEMORY
4817 030462  020527  070000            CMP     R5,#70000
4818 030466  001374                    BNE     2$
4819 030470  012705  060000            MOV     #60000,R5       ;1ST ADDRESS LOCATION IN R5
4820 030474  012703  040000            MOV     #40000,R3       ;ADDRESS 40000 IN R3
4821 030500  112737  000003  177750  1$:   MOVB    #HODO+TDAR,CMR  ;HODO ALLOWS DATA PARITY/TAG PARITY
4822                                                            ; STORE BITS TO BE WRITTEN TO
4823                                                            ;CMR<11:9> ONLY DURING THE  DESTINATION
4824                                                            ;ACCESS OF AN INSTRUCTION.
4825                                                            ;TDAR ALLOWS TAG PARITY STORE GENERATOR
4826                                                            ;INPUTS TO BE LOADED FROM AMR<8:0>
4827 030506  012737  000015  177746        MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE PARITY STORE
4828 030514  005713                    TST     (R3)            ;
4829 030516  005715                    TST     (R5)            ;WRITE 0'S INTO DATA/TAG PARITY STORE
4830                                                            ;ADDRESS LOCATION SPECIFIED BY R5
4831 030520  005715                    TST     (R5)            ;WRITE DATA/TAG PARITY BITS INTO CMR<11:9>
4832 030522  013701  177750            MOV     CMR,R1          ;SAVE CMR DATA
4833 030526  000240            25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     030530  000240                    NOP                     ;FOR  LOOP ON ERROR
4834 030532  105037  177750            CLRB    CMR             ;DISABLE MAINT. MODE
4835 030536  012737  001015  177746        MOV     #OFF,CCR        ;DISABLE CACHE
4836 030544  010537  047334            MOV     R5,CA121        ;GET PARITY ADDRESS LOCATION USED
4837 030550  006237  047334            ASR     CA121           ;PREPARE CA121 FOR TYPEOUT
4838 030554  032701  004000            BIT     #HPB,R1         ;CHECK  0 HI BYTE PARITY STORE
```

```
 4839 030560  001404                        BEQ     7$              ;PASS
 4840 030562  104406                        ERROR                   ;ERROR
                                                                    ;-----
      030564  030562                        .WORD   .-2
 4841                                                               ;DATA/TAG PARITY GEN. & STORE TESTS
 4842                                                               ;READING CACHE MAINT. REGISTER
 4843                                                               ;BIT 11 FOR UPPER BYTE PARITY DATA DID
 4844                                                               ;NOT RESULT IN 0.
 4845 030566  047334                        CA121                   ;PRINT PARITY STORE ADDRESS LOCATION
 4846                                                               ;USED: CA<12:1>
 4847 030570  000000                        .WORD   0
 4848 030572  032701  002000          7$:   BIT     #LPB,R1         ;CHECK 0 FOR LOWER BYTE PARITY DATA
 4849 030576  001404                        BEQ     8$              ;PASS
 4850 030600  104406                        ERROR                   ;ERROR
                                                                    ;-----
      030602  030600                        .WORD   .-2
 4851                                                               ;DATA/TAG PARITY GEN. $ STORE TESTS
 4852                                                               ;READING CACHE MAINT. REGISTER
 4853                                                               ;BIT 10 FOR LOWER BYTE PARITY DATA DID
 4854                                                               ;NOT RESULT IN 0.
 4855 030604  047334                        CA121                   ;PRINT PARITY STORE ADDRESS USED:CA<12:1>
 4856 030606  000000                        .WORD   0
 4857 030610  032701  001000          8$:   BIT     #TPB,R1         ;CHECK 0 FOR TAG PARITY DATA
 4858 030614  001404                        BEQ     9$              ;PASS
 4859 030616  104406                        ERROR                   ;ERROR
                                                                    ;-----
      030620  030616                        .WORD   .-2
 4860                                                               ;DATA/TAG PARITY GEN. AND STORAGE TESTS
 4861                                                               ;READING CACHE MAINT.REGISTER BIT 9 FOR
 4862                                                               ;TAG PARITY DATA DID NOT RESULT IN 0.
 4863 030622  047334                        CA121                   ;PRINT PARITY STORE ADDRESS USED: CA<12:1>
 4864 030624  000000                        .WORD   0
 4865 030626  062705  000002          9$:   ADD     #2,R5           ;NEXT PARITY STORE ADDRESS LOCATION
 4866 030632  062703  000002                ADD     #2,R3
 4867 030636  022705  070000                CMP     #70000,R5       ;HAVE ALL LOW CACHE PARITY STORE ADDRESS
 4868                                                               ;LOCATIONS BEEN DONE
 4869 030642  001316                        BNE     1$              ;NO,CONTINUE
 4870 030644  000240                 10$:   NOP                     ;END OF TEST
      030646  005237  001472                INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
TEST # 162 - CLEAR ALL CACHE DATA & TAG PARITY STORES
   4884                                 .SBTTL  TEST # 162 - CLEAR ALL CACHE DATA & TAG PARITY STORES
                                        ;;*****************************************************************
                                        ;*TEST 162 - CLEAR ALL CACHE DATA & TAG PARITY STORES
                                        ;*      WRITE AND READ 0'S TO ALL HI CACHE DATA PARITY AND TAG PARITY STORES
                                        ;*      CONDITIONS:
                                        ;*              INPUTS TO DATA PARITY GEN:
                                        ;*                  WRTD<15:0> ALL 0'S
                                        ;*                  WWPD(1)= 0
                                        ;*              INPUTS TO TAG PARITY GEN.:
                                        ;*                  TAG WRTD<21:13> ALL 0'S
                                        ;*                  WWPT(1)=0
                                        ;*                 DATA PARITY/TAG PARITY STORE ADDRESS:
                                        ;*                  CA<12:1>=4000 TO 7777
                                        ;*      RESULT:     CMR<11:9> ALL 0
                                        ;;*****************************************************************
     030652                             TST162:
   4885 030652  000004                          SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
        030654  030664                          .WORD   40$             ;TEST START LOCATION
        030656  060030                          .WORD   1$-40$+57764    ;LOOP ON ERROR START LOCATION
        030660  000000                          .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
        030662  060056                          .WORD   25$-40$+57764   ;LOOP ON ERROR END LOCATION
        030664  012737  001015  177746  40$:    MOV     #OFF,CCR        ;DISABLE CACHE
        030672  004437  002342                  JSR     R4,RELCTL       ;LOCATE TEST CODE TO LOW CACHE SPACE
        030676  031076                          .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO LOW CACHE SPACE

   4886 030700  005037  177752                  CLR     CHR             ;LOAD AMR<8:0> WITH ALL 0'S
   4887 030704  012705  070000                  MOV     #70000,R5       ;ADDRESS 70000 TO R5
   4888 030710  005025                  2$:     CLR     (R5)+           ;CLEAR ALL HI CACHE MAIN MEMORY
   4889 030712  020527  100000                  CMP     R5,#100000
   4890 030716  001374                          BNE     2$
   4891 030720  012705  070000                  MOV     #70000,R5       ;1ST ADDRESS LOCATION IN R5
   4892 030724  012703  050000                  MOV     #50000,R3       ;ADDRESS 50000 IN R3
   4893 030730  112737  000003  177750  1$:     MOVB    #HODO+TDAR,CMR  ;HODO ALLOWS DATA PARITY/TAG PARITY
   4894                                                                 ; STORE BITS TO BE WRITTEN TO
   4895                                                                 ;CMR<11:9> ONLY DURING THE  DESTINATION
   4896                                                                 ;ACCESS OF AN INSTRUCTION.
   4897                                                                 ;TDAR ALLOWS TAG PARITY STORE GENERATOR
   4898                                                                 ;INPUTS TO BE LOADED FROM AMR<8:0>
   4899 030736  012737  000015  177746          MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE PARITY
   4900                                                                 ;STORE
   4901 030744  005713                          TST     (R3)            ;
   4902 030746  005715                          TST     (R5)            ;WRITE 0'S INTO DATA/TAG PARITY STORE
   4903                                                                 ;ADDRESS LOCATION SPECIFIED BY R5
   4904 030750  005715                          TST     (R5)            ;WRITE DATA/TAG PARITY BITS INTO CMR<11:9>
   4905 030752  013701  177750                  MOV     CMR,R1          ;SAVE CMR DATA
   4906 030756  000240                  25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
        030760  000240                          NOP                     ;FOR  LOOP ON ERROR
   4907 030762  105037  177750                  CLRB    CMR             ;DISABLE MAINT. MODE
   4908 030766  012737  001015  177746          MOV     #OFF,CCR        ;DISABLE CACHE
   4909 030774  010537  047334                  MOV     R5,CA121        ;GET PARITY ADDRESS LOCATION USED
   4910 031000  006237  047334                  ASR     CA121           ;PREPARE CA121 FOR TYPEOUT
   4911 031004  032701  004000                  BIT     #HPB,R1         ;CHECK  0 HI BYTE PARITY STORE
   4912 031010  001404                          BEQ     7$              ;PASS
```

```
4913 031012  104406                   ERROR                   ;ERROR
                                                              ;-----
     031014  031012                   .WORD   .-2
4914                                                          ;DATA/TAG PARITY GEN. & STORE TESTS
4915                                                          ;READING CACHE MAINT. REGISTER
4916                                                          ;BIT 11 FOR UPPER BYTE PARITY DATA DID
4917                                                          ;NOT RESULT IN 0.
4918 031016  047334                   CA121                   ;PRINT PARITY STORE ADDRESS LOCATION
4919                                                          ;USED: CA<12:1>
4920 031020  000000                   .WORD   0
4921 031022  032701  002000     7$:   BIT     #LPB,R1         ;CHECK 0 FOR LOWER BYTE PARITY DATA
4922 031026  001404                   BEQ     8$              ;PASS
4923 031030  104406                   ERROR                   ;ERROR
                                                              ;-----
     031032  031030                   .WORD   .-2
4924                                                          ;DATA/TAG PARITY GEN. $ STORE TESTS
4925                                                          ;READING CACHE MAINT. REGISTER
4926                                                          ;BIT 10 FOR LOWER BYTE PARITY DATA DID
4927                                                          ;NOT RESULT IN 0.
4928 031034  047334                   CA121                   ;PRINT PARITY STORE ADDRESS USED:CA<12:1>
4929 031036  000000                   .WORD   0
4930 031040  032701  001000     8$:   BIT     #TPB,R1         ;CHECK 0 FOR TAG PARITY DATA
4931 031044  001404                   BEQ     9$              ;PASS
4932 031046  104406                   ERROR                   ;ERROR
                                                              ;-----
     031050  031046                   .WORD   .-2
4933                                                          ;DATA/TAG PARITY GEN. AND STORAGE TESTS
4934                                                          ;READING CACHE MAINT.REGISTER BIT 9 FOR
4935                                                          ;TAG PARITY DATA DID NOT RESULT IN 0.
4936 031052  047334                   CA121                   ;PRINT PARITY STORE ADDRESS USED: CA<12:1>
4937 031054  000000                   .WORD   0
4938 031056  062705  000002     9$:   ADD     #2,R5           ;NEXT PARITY STORE ADDRESS LOCATION
4939 031062  062703  000002           ADD     #2,R3
4940 031066  022705  100000           CMP     #100000,R5      ;HAVE ALL HI CACHE PARITY STORE ADDRESS
4941                                                          ;LOCATIONS BEEN DONE
4942 031072  001316                   BNE     1$              ;NO,CONTINUE
4943 031074  000240                10$:   NOP                     ;END OF TEST
     031076  005237  001472           INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
 4957                                   .SBTTL  TEST # 163 - CHK SETTING HI CACHE DATA & TAG PARITY STORES
                                        ;;*****************************************************************
                                        ;*TEST 163 - CHK SETTING HI CACHE DATA & TAG PARITY STORES
                                        ;*      WRITE AND READ 1'S TO ALL LOW CACHE DATA PARITY AND TAG PARITY STORES
                                        ;*      CONDITIONS:
                                        ;*              INPUTS TO DATA PARITY GEN:
                                        ;*                  WRTD<15:0>= 000401
                                        ;*                  WWPD(1)= 0
                                        ;*              INPUTS TO TAG PARITY GEN.:
                                        ;*                  TAG WRTD<21:13> BIT PATTERN 000000001
                                        ;*                  WWPT(1)=0
                                        ;*                DATA PARITY/TAG PARITY STORE ADDRESS:
                                        ;*                  CA<12:1>=0000 TO 3777
                                        ;*      RESULT:     CMR<11:9> ALL 1'S
                                        ;;*****************************************************************
      031102                            TST163:
 4958 031102  000004                            SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
      031104  031114                            .WORD   40$             ;TEST START LOCATION
      031106  070034                            .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
      031110  000000                            .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
      031112  070062                            .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
      031114  012737  001015  177746  40$:      MOV     #OFF,CCR        ;DISABLE CACHE
      031122  004437  002370                    JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
      031126  031332                            .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

 4959 031130  012737  000001  177752          MOV     #1,CHR          ;LOAD AMR<8:0> WITH BIT PATTERN 000000001
 4960 031136  012705  060000                  MOV     #60000,R5       ;ADDRESS 60000 TO R5
 4961 031142  012725  000401          2$:     MOV     #401,(R5)+      ;WRITE A 401 IN ALL LOW CACHE MAIN MEMORY
 4962 031146  020527  070000                  CMP     R5,#70000
 4963 031152  001373                          BNE     2$
 4964 031154  012705  060000                  MOV     #60000,R5       ;1ST ADDRESS LOCATION IN R5
 4965 031160  012703  040000                  MOV     #40000,R3       ;ADDRESS 40000 IN R3
 4966 031164  112737  000003  177750  1$:     MOVB    #HODO+TDAR,CMR  ;HODO ALLOWS DATA PARITY/TAG PARITY
 4967                                                                  ; STORE BITS TO BE WRITTEN TO
 4968                                                                  ;CMR<11:9> ONLY DURING THE  DESTINATION
 4969                                                                  ;ACCESS OF AN INSTRUCTION.
 4970                                                                  ;TDAR ALLOWS TAG PARITY STORE GENERATOR
 4971                                                                  ;INPUTS TO BE LOADED FROM AMR<8:0>
 4972 031172  012737  000015  177746          MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE PARITY STORE
 4973 031200  005713                          TST     (R3)            ;
 4974 031202  005715                          TST     (R5)            ;WRITE 1'S INTO DATA/TAG PARITY STORE
 4975                                                                  ;ADDRESS LOCATION SPECIFIED BY R5
 4976 031204  005715                          TST     (R5)            ;WRITE DATA/TAG PARITY BITS INTO CMR<11:9>
 4977 031206  013701  177750                  MOV     CMR,R1          ;SAVE CMR DATA
 4978 031212  000240                  25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
      031214  000240                          NOP                     ;FOR  LOOP ON ERROR
 4979 031216  105037  177750                  CLRB    CMR             ;DISABLE MAINT. MODE
 4980 031222  012737  001015  177746          MOV     #OFF,CCR        ;DISABLE CACHE
 4981 031230  010537  047334                  MOV     R5,CA121        ;GET PARITY ADDRESS LOCATION USED
 4982 031234  006237  047334                  ASR     CA121           ;PREPARE CA121 FOR TYPEOUT
 4983 031240  032701  004000                  BIT     #HPB,R1         ;CHECK  1 HI BYTE PARITY STORE
 4984 031244  001004                          BNE     7$              ;PASS
 4985 031246  104406                          ERROR                   ;ERROR
```

```
                                                                ;-----
     031250  031246                          .WORD   .-2
4986
4987                                                            ;DATA/TAG PARITY GEN. & STORE TESTS
4988                                                            ;READING CACHE MAINT. REGISTER
4989                                                            ;BIT 11 FOR UPPER BYTE PARITY DATA DID
4990 031252  047334                          CA121              ;NOT RESULT IN 1.
4991                                                            ;PRINT PARITY STORE ADDRESS LOCATION
4992 031254  000000                          .WORD   0          ;USED: CA<12:1>
4993 031256  032701  002000          7$:     BIT     #LPB,R1    ;CHECK 1 FOR LOWER BYTE PARITY DATA
4994 031262  001004                          BNE     8$         ;PASS
4995 031264  104406                          ERROR              ;ERROR
                                                                ;-----
     031266  031264                          .WORD   .-2
4996
4997                                                            ;DATA/TAG PARITY GEN. & STORE TESTS
4998                                                            ;READING CACHE MAINT. REGISTER
4999                                                            ;BIT 10 FOR LOWER BYTE PARITY DATA DID
5000 031270  047334                          CA121              ;NOT RESULT IN 1.
5001 031272  000000                          .WORD   0          ;PRINT PARITY STORE ADDRESS USED:CA<12:1>
5002 031274  032701  001000          8$:     BIT     #TPB,R1    ;CHECK 1 FOR TAG PARITY DATA
5003 031300  001004                          BNE     9$         ;PASS
5004 031302  104406                          ERROR              ;ERROR
                                                                ;-----
     031304  031302                          .WORD   .-2
5005                                                            ;DATA/TAG PARITY GEN. AND STORAGE TESTS
5006                                                            ;READING CACHE MAINT.REGISTER BIT 9 FOR
5007                                                            ;TAG PARITY DATA DID NOT RESULT IN 1.
5008 031306  047334                          CA121              ;PRINT PARITY STORE ADDRESS USED: CA<12:1>
5009 031310  000000                          .WORD   0
5010 031312  062705  000002          9$:     ADD     #2,R5      ;NEXT PARITY STORE ADDRESS LOCATION
5011 031316  062703  000002                  ADD     #2,R3
5012 031322  022705  070000                  CMP     #70000,R5  ;HAVE ALL LOW CACHE PARITY STORE ADDRESS
5013                                                            ;LOCATIONS BEEN DONE
5014 031326  001316                          BNE     1$         ;NO,CONTINUE
5015 031330  000240                  10$:    NOP                ;END OF TEST
     031332  005237  001472                  INC     $TESTN     ;INCREMENT TEST COUNTER
```

TEST # 164 - CHK SETTING HI CACHE DATA & TAG PARITY STORES

```
5029                                    .SBTTL  TEST # 164 - CHK SETTING HI CACHE DATA & TAG PARITY STORES
                                        ;;*****************************************************************
                                        ;*TEST 164 - CHK SETTING HI CACHE DATA & TAG PARITY STORES
                                        ;*      WRITE AND READ 1'S TO ALL HI CACHE DATA PARITY AND TAG PARITY STORES
                                        ;*      CONDITIONS:
                                        ;*              INPUTS TO DATA PARITY GEN:
                                        ;*                  WRTD<15:0>= 000401
                                        ;*                  WWPD(1)= 0
                                        ;*              INPUTS TO TAG PARITY GEN.:
                                        ;*                  TAG WRTD<21:13> =BIT PATTERN 000000001
                                        ;*                  WWPT(1)=0
                                        ;*                 DATA PARITY/TAG PARITY STORE ADDRESS:
                                        ;*                  CA<12:1>=4000 TO 7777
                                        ;*      RESULT:     CMR<11:9> ALL 1'S
                                        ;;*****************************************************************
    031336                              TST164:
5030 031336  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     031340  031350                             .WORD   40$             ;TEST START LOCATION
     031342  060034                             .WORD   1$-40$+57764    ;LOOP ON ERROR START LOCATION
     031344  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     031346  060062                             .WORD   25$-40$+57764   ;LOOP ON ERROR END LOCATION
     031350  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     031356  004437  002342                     JSR     R4,RELCTL       ;LOCATE TEST CODE TO LOW CACHE SPACE
     031362  031566                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO LOW CACHE SPACE

5031 031364  012737  000001  177752             MOV     #1,CHR          ;LOAD AMR<8:0> WITH BIT PATTERN 000000001
5032 031372  012705  070000                     MOV     #70000,R5       ;ADDRESS 70000 TO R5
5033 031376  012725  000401          2$:        MOV     #401,(R5)+      ;WRITE A 401 TO ALL HI CACHE
5034 031402  020527  100000                     CMP     R5,#100000
5035 031406  001373                             BNE     2$
5036 031410  012705  070000                     MOV     #70000,R5       ;1ST ADDRESS LOCATION IN R5
5037 031414  012703  050000                     MOV     #50000,R3       ;ADDRESS 50000 IN R3
5038 031420  112737  000003  177750  1$:        MOVB    #HODO+TDAR,CMR  ;HODO ALLOWS DATA PARITY/TAG PARITY
5039                                                                    ; STORE BITS TO BE WRITTEN TO
5040                                                                    ;CMR<11:9> ONLY DURING THE  DESTINATION
5041                                                                    ;ACCESS OF AN INSTRUCTION.
5042                                                                    ;TDAR ALLOWS TAG PARITY STORE GENERATOR
5043                                                                    ;INPUTS TO BE LOADED FROM AMR<8:0>
5044 031426  012737  000015  177746             MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE PARITY STORE
5045 031434  005713                             TST     (R3)            ;
5046 031436  005715                             TST     (R5)            ;WRITE 1'S INTO DATA/TAG PARITY STORE
5047                                                                    ;ADDRESS LOCATION SPECIFIED BY R5
5048 031440  005715                             TST     (R5)            ;WRITE DATA/TAG PARITY BITS INTO CMR<11:9>
5049 031442  013701  177750                     MOV     CMR,R1          ;SAVE CMR DATA
5050 031446  000240                  25$:       NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     031450  000240                             NOP                     ;FOR  LOOP ON ERROR
5051 031452  105037  177750                     CLRB    CMR             ;DISABLE MAINT. MODE
5052 031456  012737  001015  177746             MOV     #OFF,CCR        ;DISABLE CACHE
5053 031464  010537  047334                     MOV     R5,CA121        ;GET PARITY ADDRESS LOCATION USED
5054 031470  006237  047334                     ASR     CA121           ;PREPARE CA121 FOR TYPEOUT
5055 031474  032701  004000                     BIT     #HPB,R1         ;CHECK  1 HI BYTE PARITY STORE
5056 031500  001004                             BNE     7$              ;PASS
5057 031502  104406                             ERROR                   ;ERROR
```

```
                                                                ;-----
     031504  031502                          .WORD   .-2
5058                                                            ;DATA/TAG PARITY GEN. & STORE TESTS
5059                                                            ;READING CACHE MAINT. REGISTER
5060                                                            ;BIT 11 FOR UPPER BYTE PARITY DATA DID
5061                                                            ;NOT RESULT IN 1.
5062 031506  047334                          CA121                      ;PRINT PARITY STORE ADDRESS LOCATION
5063                                                            ;USED: CA<12:1>
5064 031510  000000                          .WORD   0
5065 031512  032701  002000          7$:     BIT     #LPB,R1            ;CHECK 1 FOR LOWER BYTE PARITY DATA
5066 031516  001004                          BNE     8$                 ;PASS
5067 031520  104406                          ERROR                      ;ERROR
                                                                ;-----
     031522  031520                          .WORD   .-2
5068                                                            ;DATA/TAG PARITY GEN. $ STORE TESTS
5069                                                            ;READING CACHE MAINT. REGISTER
5070                                                            ;BIT 10 FOR LOWER BYTE PARITY DATA DID
5071                                                            ;NOT RESULT IN 1.
5072 031524  047334                          CA121                      ;PRINT PARITY STORE ADDRESS USED:CA<12:1>
5073 031526  000000                          .WORD   0
5074 031530  032701  001000          8$:     BIT     #TPB,R1            ;CHECK 1 FOR TAG PARITY DATA
5075 031534  001004                          BNE     9$                 ;PASS
5076 031536  104406                          ERROR                      ;ERROR
                                                                ;-----
     031540  031536                          .WORD   .-2
5077                                                            ;DATA/TAG PARITY GEN. AND STORAGE TESTS
5078                                                            ;READING CACHE MAINT.REGISTER BIT 9 FOR
5079                                                            ;TAG PARITY DATA DID NOT RESULT IN 0.
5080 031542  047334                          CA121                      ;PRINT PARITY STORE ADDRESS USED: CA<12:1>
5081 031544  000000                          .WORD   0
5082 031546  062705  000002          9$:     ADD     #2,R5              ;NEXT PARITY STORE ADDRESS LOCATION
5083 031552  062703  000002                  ADD     #2,R3
5084 031556  022705  100000                  CMP     #100000,R5         ;HAVE ALL HI CACHE PARITY STORE ADDRESS
5085                                                            ;LOCATIONS BEEN DONE
5086 031562  001716                          BEQ     1$                 ;NO,CONTINUE
5087 031564  000240                  10$:    NOP                        ;END OF TEST
     031566  005237  001472                  INC     $TESTN             ;INCREMENT TEST COUNTER
```

```
   5100                                 .SBTTL  TEST # 165 - VERIFY BYTE DATA PARITY STORE ADDRESS LINES
                                        ;;*****************************************************************
                                        ;*TEST 165 - VERIFY BYTE DATA PARITY STORE ADDRESS LINES
                                        ;*      VERIFY HI & LO BYTE DATA PARITY STORE ADDRESS LINES
                                        ;*      PROCEDURE:      WRITE 0 INTO HI & LO BYTE DATA PARITY STORE
                                        ;*                      ADDRESS LOCATION 0000.
                                        ;*                      WRITE A 1 INTO HI & LO BYTE DATA PARITY STORE
                                        ;*                      ADDRESS LOCAT. 0001.
                                        ;*                      READ HI & LO BYTE DATA PARITY ADDRESS LOC.
                                        ;*                      0000 FOR 0'S.
                                        ;*                      REPEAT THE ABOVE SEQUENCE ,EACH TIME CHANGING THE
                                        ;*                      ADDRESS LOCATION THE 1 IS WRITTEN INTO BY
                                        ;*                      SHIFTING THE 1 ONE PLACE TO THE LEFT.
                                        ;;*****************************************************************
      031572                            TST165:
   5101 031572  000004                          SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
      031574  031604                            .WORD   40$             ;TEST START LOCATION
      031576  070040                            .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
      031600  000000                            .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
      031602  070100                            .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
      031604  012737  001015  177746  40$:      MOV     #OFF,CCR        ;DISABLE CACHE
      031612  004437  002370                    JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
      031616  032042                            .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

   5102 031620  000240                          NOP                     ;THIS 'NOP' WILL BE AT LOCATION 70000
   5103                                                                 ;WHEN THE TEST IS RELOCATED TO HI
   5104                                                                 ;CACHE. IT WILL BE OVERWRITTEN WITH
   5105                                                                 ;'401' WHEN THE TEST IS EXECUTED.
   5106 031622  005037  060000                    CLR     60000           ;CLEAR LOCATION 60000 IN MAIN MEMORY
   5107 031626  012737  000002  047344            MOV     #2,FLTPAT       ;1ST FLOATING CACHE DATA STORE ADDRESS PATTERN
   5108 031634  012702  040000          2$:       MOV     #40000,R2       ;ADDRESS 40000 INTO R2
   5109 031640  012703  060000                    MOV     #60000,R3       ;ADRESS 60000 INTO R3
   5110 031644  063702  047344                    ADD     FLTPAT,R2       ;R2 CONTAINS 40000+FLTPAT
   5111 031650  063703  047344                    ADD     FLTPAT,R3       ;R3 CONTAINS 60000+FLTPAT
   5112 031654  012713  000401                    MOV     #401,(R3)       ;ODD DATA IN HI & LO BYTE AREAS OF
   5113                                                                 ;LOCATION SPECIFIED BY R3
   5114 031660  112737  000002  177750  1$:       MOVB    #HODO,CMR       ;HODO ALLOWS HI & LO BYTE DATA PARITY
   5115                                                                 ;STORE BITS TO BE WRITTEN TO CMR<11:10>
   5116                                                                 ; ONLY DURING THE
   5117                                                                 ;DESTINATION MEMORY ACCESS OF AN INSTRUCTION.
   5118 031666  012737  000015  177746            MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE DATA PARITY STORE
   5119 031674  005737  040000                    TST     40000
   5120 031700  005737  060000                    TST     60000           ;READ UPDATE: WRITE 0'S INTO HI AND LO
   5121                                                                 ;BYTE DATA PARITY STORES
   5122 031704  005712                            TST     (R2)
   5123 031706  005713                            TST     (R3)            ;WRITE 1 INTO HI & LO BYTE DATA
   5124                                                                 ;PARITY STORE LOCATION
   5125                                                                 ;SPECIFIED BY R3'S BITS 1 THRU 12:CA<12:1>.
   5126 031710  005737  060000                    TST     60000           ;LOAD DATA FROM HI & LO BYTE PARITY
   5127                                                                 ;DATA PARITY STORE LOCATION
   5128                                                                 ;0000 INTO CMR<11:10>.
   5129 031714  013701  177750                    MOV     CMR,R1          ;SAVE CMR DATA
   5130 031720  000240                  25$:      NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
```

TEST # 165 - VERIFY BYTE DATA PARITY STORE ADDRESS LINES

```
      031722  000240                          NOP                     ;FOR  LOOP ON ERROR
 5131 031724  105037  177750                  CLRB    CMR             ;DISABLE MAINT. MODE
 5132 031730  012737  001015  177746          MOV     #OFF,CCR        ;DISABLE CACHE
 5133 031736  032701  004000                  BIT     #HPB,R1         ;READING CMR<11> FOR HI BYTE
 5134                                                                 ;DATA PARITY STORE DATA SHOULD RESULT
 5135                                                                 ;IN 0.
 5136 031742  001411                          BEQ     8$              ;PASS
 5137 031744  013737  047344  047334          MOV     FLTPAT,CA121    ;SAVE CA<12:1> USED
 5138 031752  006237  047334                  ASR     CA121           ;PREPARE CA121 FOR TYPEOUT
 5139 031756  104406                          ERROR                   ;ERROR
                                                                      ;-----
      031760  031756                          .WORD   .-2
 5140                                                                 ;HI & LO BYTE DATA PARITY STORE ADDRESS TEST
 5141                                                                 ;HI BYTE DATA PARITY STORE LOC. 0000
 5142                                                                 ;DID NOT READ AS A 0 INDICATING THAT
 5143                                                                 ;IT WAS OVERWRITTEN WITH A 1. THIS
 5144                                                                 ;SUGGESTS HI BYTE DATA PARITY STORE
 5145                                                                 ;ADDRESS LINE IS BAD.
 5146 031762  047334                          CA121                   ;PRINT PARITY DTORE ADDRESS FAILURE
 5147                                                                 ;CA<12:1>.
 5148                                                                 ;NOTE THAT THE 1 IN THIS PATTERN
 5149                                                                 ;WILL POINT TO THE ADDRESS LINE OF
 5150                                                                 ;THAT BROUGHT OUT ERROR.
 5151 031764  000000                          .WORD   0
 5152 031766  032701  004000          8$:     BIT     #HPB,R1         ;READING CMR<10> FOR LO BYTE
 5153                                                                 ;DATA PARITY STORE DATA SHOULD RESULT
 5154                                                                 ;IN 0.
 5155 031772  001411                          BEQ     9$              ;PASS
 5156 031774  013737  047344  047334          MOV     FLTPAT,CA121    ;SAVE CA<12:1> USED
 5157 032002  006237  047334                  ASR     CA121           ;PREPARE CA121 FOR TYPEOUT
 5158 032006  104406                          ERROR                   ;ERROR
                                                                      ;-----
      032010  032006                          .WORD   .-2
 5159                                                                 ;HI & LO BYTE DATA PARITY STORE ADDRESS TEST
 5160                                                                 ;LO BYTE DATA PARITY STORE LOC. 0000
 5161                                                                 ;DID NOT READ AS A 0 INDICATING THAT
 5162                                                                 ;IT WAS OVERWRITTEN WITH A 1. THIS
 5163                                                                 ;SUGGESTS HI BYTE DATA PARITY STORE
 5164                                                                 ;ADDRESS LINE IS BAD.
 5165 032012  047334                          CA121                   ;PRINT PARITY STORE ADDRESS FAILURE
 5166                                                                 ;CA<12:1>.
 5167                                                                 ;NOTE THAT THE 1 IN THIS PATTERN
 5168                                                                 ;WILL POINT TO THE ADDRESS LINE OF
 5169                                                                 ;THAT BROUGHT OUT ERROR.
 5170 032014  000000                          .WORD   0
 5171 032016  006337  047344          9$:     ASL     FLTPAT          ;NEXT PATTERN
 5172 032022  022737  020000  047344          CMP     #20000,FLTPAT   ;HAS DATA PARITY  STORE  ADDRESS 4000 BEEN DONE?
 5173 032030  001301                          BNE     2$              ;NO
 5174 032032  012737  000240  070000          MOV     #240,70000      ;RESTORE OVERWRITTEN LOCATION 70000 WITH NOP.
 5175 032040  000240                  10$:    NOP                     ;END OF TEST
      032042  005237  001472                  INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
   5188                                 .SBTTL  TEST # 166 - VERIFY TAG PARITY STORE ADDRESS LINES
                                        ;;*****************************************************************
                                        ;*TEST 166 - VERIFY TAG PARITY STORE ADDRESS LINES
                                        ;*      VERIFY TAG PARITY STORE ADDRESS LINES
                                        ;*      PROCEDURE:      WRITE 0 INTO TAG PARITY STORE
                                        ;*                      ADDRESS LOCATION 0000.
                                        ;*                      WRITE A 1 INTO TAG PARITY STORE
                                        ;*                      ADDRESS LOCAT. 0001.
                                        ;*                      READ TAG PARITY ADDRESS LOC.
                                        ;*                      0000 FOR 0'S.
                                        ;*                      REPEAT THE ABOVE SEQUENCE ,EACH TIME CHANGING THE
                                        ;*                      ADDRESS LOCATION THE 1 IS WRITTEN INTO BY
                                        ;*                      SHIFTING THE 1 ONE PLACE TO THE LEFT.
                                        ;;*****************************************************************
     032046                             TST166:
   5189 032046  000004                          SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
        032050  032060                          .WORD   40$             ;TEST START LOCATION
        032052  070026                          .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
        032054  000000                          .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
        032056  070066                          .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
        032060  012737  001015  177746  40$:    MOV     #OFF,CCR        ;DISABLE CACHE
        032066  004437  002370                  JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
        032072  032246                          .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

   5190 032074  012737  000002  047344          MOV     #2,FLTPAT       ;1ST FLOATING CACHE DATA STORE ADDRESS PATTERN
   5191 032102  012702  040000          2$:     MOV     #40000,R2       ;ADDRESS 40000 INTO R2
   5192 032106  012703  060000                  MOV     #60000,R3       ;ADRESS 60000 INTO R3
   5193 032112  063702  047344                  ADD     FLTPAT,R2       ;R2 CONTAINS 40000+FLTPAT
   5194 032116  063703  047344                  ADD     FLTPAT,R3       ;R3 CONTAINS 60000+FLTPAT
   5195 032122  112737  000002  177750  1$:     MOVB    #HODO,CMR       ;HODO ALLOWS TAG PARITY
   5196                                                                 ;STORE BITS TO BE WRITTEN TO CMR<9>
   5197                                                                 ; ONLY DURING THE
   5198                                                                 ;DESTINATION MEMORY ACCESS OF AN INSTRUCTION.
   5199 032130  012737  000015  177746          MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE DATA PARITY STORE
   5200 032136  005737  040000                  TST     40000
   5201 032142  005737  060000                  TST     60000           ;READ UPDATE: WRITE 0 INTO TAG
   5202                                                                 ; PARITY STORE
   5203 032146  005713                          TST     (R3)
   5204 032150  005712                          TST     (R2)            ;WRITE 1 INTO TAG
   5205                                                                 ;PARITY STORE LOCATION
   5206                                                                 ;SPECIFIED BY R2'S BITS 1 THRU 12:CA<12:1>.
   5207 032152  005737  060000                  TST     60000           ;LOAD DATA FROM
   5208                                                                 ;TAG PARITY STORE LOCATION
   5209                                                                 ;0000 INTO CMR<9>.
   5210 032156  013701  177750                  MOV     CMR,R1          ;SAVE CMR DATA
   5211 032162  000240          25$:    NOP                             ;INSTRUCTION 'JMP 1$' PLACED HERE
        032164  000240                  NOP                             ;FOR  LOOP ON ERROR
   5212 032166  105037  177750                  CLRB    CMR             ;DISABLE MAINT. MODE
   5213 032172  012737  001015  177746          MOV     #OFF,CCR        ;DISABLE CACHE
   5214 032200  032701  001000                  BIT     #TPB,R1         ;READING CMR<9> FOR TAG PARITY STORE
   5215                                                                 ;DATA SHOULD RESULT IN 0
   5216 032204  001411                          BEQ     9$              ;PASS
   5217 032206  013737  047344  047334          MOV     FLTPAT,CA121    ;SAVE CA<12:1> USED
```

```
 5218 032214  006237  047334                ASR     CA121           ;PREPARE CA121 FOR TYPEOUT
 5219 032220  104406                        ERROR                   ;ERROR
                                                                    ;-----
      032222  032220                        .WORD   .-2
 5220                                                               ;TAG PARITY STORE ADDRESS TEST
 5221                                                               ;TAG PARITY STORE LOC. 0000
 5222                                                               ;DID NOT READ AS A 0 INDICATING THAT
 5223                                                               ;IT WAS OVERWRITTEN WITH A 1. THIS
 5224                                                               ;SUGGESTS TAG PARITY STORE
 5225                                                               ;ADDRESS LINE IS BAD.
 5226 032224  047334                        CA121                   ;PRINT PARITY STORE ADDRESS FAILURE
 5227                                                               ;CA<12:1>.
 5228                                                               ;NOTE THAT THE 1 IN THIS PATTERN
 5229                                                               ;WILL POINT TO THE ADDRESS LINE OF
 5230                                                               ;THAT BROUGHT OUT ERROR.
 5231 032226  000000                        .WORD   0
 5232 032230  006337  047344          9$:   ASL     FLTPAT          ;NEXT PATTERN
 5233 032234  022737  020000  047344        CMP     #20000,FLTPAT   ;HAS TAG PARITY  STORE  ADDRESS 4000 BEEN DONE?
 5234 032242  001317                        BNE     2$              ;NO
 5235 032244  000240                 10$:   NOP                     ;END OF TEST
      032246  005237  001472                INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
5240                                    .SBTTL  TEST # 167 - PARITY ERROR BITS IN CME=0 AFTER WRITE TO CME
                                        ;;*****************************************************************
                                        ;*TEST 167 - PARITY ERROR BITS IN CME=0 AFTER WRITE TO CME
                                        ;*      VERIFY THAT ALL PARITY ERROR BITS IN CACHE MEMORY ERROR REGISTER
                                        ;*      WILL READ 0 FOLLOWING A WRITE TO CME.
                                        ;;*****************************************************************
     032252                             TST167:
5241 032252  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     032254  032264                             .WORD   40$             ;TEST START LOCATION
     032256  070000                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     032260  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     032262  070016                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     032264  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     032272  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     032276  032350                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

5242 032300  112737  000002  177750  1$:        MOVB    #HODO,CMR       ;HODO WILL ALLOW CLOCKING OF PARITY INFO.
5243                                                                    ;TO CME ONLY DURING THE DESTINATION ACCESS OF AN
5244                                                                    ;INSTRUCTION. THE EFFECT
5245                                                                    ;IS THAT NO CLOCKING WILL OCCUR DURING EXECUTION
5246                                                                    ;OF THE NEXT  INSTRUCTION.
5247 032306  005037  177744                     CLR     CME             ;WRITE TO CME
5248 032312  013701  177744                     MOV     CME,R1          ;SAVE CME CONTENTS.
5249 032316  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     032320  000240                             NOP                     ;FOR  LOOP ON ERROR
5250 032322  105037  177750                     CLRB    CMR             ;DISABLE MAINTENANCE MODE
5251 032326  005701                             TST     R1              ;ARE ALL BITS 0?
5252 032330  001406                             BEQ     10$             ;PASS
5253 032332  010137  047346                     MOV     R1,RECDAT       ;GET CME CONTENTS RECEIVED
5254 032336  104406                             ERROR                   ;ERROR
                                                                        ;-----
     032340  032336                             .WORD   .-2
5255                                                                    ;PARITY ERROR CHECK TESTS
5256                                                                    ;WRITING TO CME DID NOT LEAVE ALL PARITY ERROR BITS 0
5257 032342  047346                     RECDAT                          ;PRINT CME CONTENTS RECEIVED
5258 032344  000000                             .WORD   0
5259 032346  000240                     10$:    NOP                     ;END OF TEST
     032350  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
TEST # 170 - CME CAN SHOW NO PARITY ERROR FOLLOWING READ HIT
   5270                                 .SBTTL  TEST # 170 - CME CAN SHOW NO PARITY ERROR FOLLOWING READ HIT
                                        ;;*****************************************************************
                                        ;*TEST 170 - CME CAN SHOW NO PARITY ERROR FOLLOWING READ HIT
                                        ;*      VERIFY THAT CME CAN SHOW NO PARITY ERRORS FOLOWING A READ HIT CONDITION
                                        ;*      VERIFY TAG/DATA 'PARITY CHECK PARITY GENERATORS' WITH ALL 0'S
                                        ;*      ON THEIR INPUTS.
                                        ;*      PROCEDURE:  CREATE ALL 0'S ON THE INPUTS OF THE TAG/DATA
                                        ;*                  PARITY CHECK PARITY GENERATORS DURING A READ
                                        ;*                  HIT CONDITION.ALLOW PARITY INFO. TO BE CLOCKED TO
                                        ;*                  CME.
                                        ;*      RESULT:     CME<15>,<7>,<6>,<5> ALL 0'S
                                        ;;*****************************************************************
        032354                          TST170:
   5271 032354  000004                          SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
        032356  032366                          .WORD   40$             ;TEST START LOCATION
        032360  070016                          .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
        032362  000000                          .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
        032364  070072                          .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
        032366  012737  001015  177746  40$:     MOV     #OFF,CCR        ;DISABLE CACHE
        032374  004437  002370                  JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
        032400  032550                          .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

   5272 032402  052737  000400  177746          BIS     #FC,CCR         ;FLUSH CACHE TO INVALIDATE ALL CACHE LOCATIONS
   5273 032410  032737  010000  177746  200$:   BIT     #VCIP,CCR       ;WAIT TILL DONE
   5274 032416  001374                          BNE     200$
   5275 032420  005037  000000          1$:     CLR     0               ;0'S TO MAIN MEMORY LOCATION 0
   5276 032424  112737  000002  177750          MOVB    #HODO,CMR       ;HODO ALLOWS CLOCKING OF PARITY INFO TO
   5277                                                                 ;CME ONLY DURING THE DESTINATION ACCESS OF
   5278                                                                 ;OF AN INSTRUCTION
   5279 032432  012737  000015  177746          MOV     #15,CCR         ;NO UCB SO AS TO WRITE CACHE STORES
   5280 032440  005737  040000                  TST     40000           ;
   5281 032444  005737  000000                  TST     0               ;READ UPDATE TO CACHE LOCATION 0000-
   5282                                                                 ;ALL 0'S WILL BE WRITTEN INTO DATA/TAG STORES
   5283                                                                 ;AND A 0 INTO DATA/TAG PARITY STORES
   5284 032450  005037  177744                  CLR     CME             ;CLEAR CME
   5285 032454  005737  000000                  TST     0               ;READ HIT-ALL 0'S WILL BE PLACED ON INPUTS
   5286                                                                 ;OF DATA/TAG PARITY DETECT PARITY GENERATORS
   5287                                                                 ;AND ALL PARITY INFO WILL BE CLOCKED TO CME
   5288 032460  052737  000200  177746          BIS     #PEA,CCR        ;SET CCR<7> SO AS TO ENABLE CME<7>,<6>,<5> TO
   5289                                                                 ;TO BE WRITTEN INDIVIDUALLY FROM
   5290                                                                 ;PARITY INFO LOGIC,AND TO WRITE  CME<15>.
   5291 032466  000240                          NOP
   5292 032470  013701  177744                  MOV     CME,R1          ;SAVE CME CONTENTS
   5293 032474  000240                  25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
        032476  000240                          NOP                     ;FOR  LOOP ON ERROR
   5294 032500  012737  001015  177746          MOV     #OFF,CCR        ;DISABLE CACHE
   5295 032506  105037  177750                  CLRB    CMR             ;DISABLE MAINTENANCE MODE
   5296 032512  012737  000002  000000          MOV     #2,0            ;RESTORE LOCATION 0
   5297 032520  005701                          TST     R1              ;WERE ALL PARITY ERROR BITS IN CME=0?
   5298 032522  001411                          BEQ     10$             ;PASS;NEXT TEST
   5299 032524  005037  047332                  CLR     EXDAT6          ;SPECIFY CME CONTENTS EXPECTED
   5300 032530  010137  047346                  MOV     R1,RECDAT       ;GET CME CONTENTS RECEIVED
   5301 032534  104406                          ERROR                   ;ERROR
```

TEST # 170 - CME CAN SHOW NO PARITY ERROR FOLLOWING READ HIT

```
                                                                ;-----
      032536  032534                        .WORD   .-2
 5302                                                           ;PARITY CHECK TESTS
 5303                                                           ;ALL PARITY ERROR BITS IN CME SHOULD HAVE READ 0
 5304 032540  047332                        EXDAT6              ;PRINT EXPECTED CME CONTENTS
 5305 032542  047346                        RECDAT              ;PRINT CONTENTS OF CME RECEIVED
 5306 032544  000000                        .WORD   0
 5307 032546  000240              10$:      NOP                 ;END OF TEST
      032550  005237  001472                INC     $TESTN      ;INCREMENT TEST COUNTER
```

```
                        .SBTTL  TEST # 171 - PARITY ERROR BIT CHECK
                        ;;*****************************************************************
                        ;*TEST 171 - PARITY ERROR BIT CHECK
                        ;*      VERIFY THE FOLLOWING  WHEN A LOCATION PREVIOUSLY WRITTEN
                        ;*      WITH WRONG TAG PARITY IS ACCESSED:
                        ;*              1. A PARITY ERROR IS DETECTED AND ALL PARITY ERROR BITS IN
                        ;*                 CME READ CORRECTLY WITH PEA CLEARED,
                        ;*              2.  ALL PARITY ERROR ERROR BITS READ CORRECTLY WITH PEA
                        ;*                 SET.
                        ;*              3.  A WRITE TO CME CLEARS CME<15> AND <5> FROM A 1 STATE
                        ;*      PROCEDURE:      WRITE WRONG PARITY TO TAG PARITY STORE LOCATION
                        ;*                      0000. CLOCK PARITY INFO. TO CME.
                        ;*      CONDITIONS:     DATA PARITY CHECK PARITY GEN. INPUTS:
                        ;*                        ALL 0'S
                        ;*                      TAG PARITY CHECK PAR. GEN. INPUTS:
                        ;*                        TAGD<20:13>= ALL 0'S
                        ;*                        TAG PARITY BIT=1
                        ;*      RESULTS:        PEA CLEARED:
                        ;*                        CME<15>=0
                        ;*                        CME<7>,<6>,<5>=1
                        ;*                      PEA SET:
                        ;*                        CME<15>=1
                        ;*                        CME<7>,<6>=0
                        ;*                        CME<5>=1
                        ;;*****************************************************************
                        TST171:
      032554
 5332 032554  000004            SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                        ;ERROR/LOOP ON TEST
      032556  032566            .WORD   40$             ;TEST START LOCATION
      032560  070016            .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
      032562  000000            .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
      032564  070126            .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
      032566  012737  001015  177746  40$:    MOV     #OFF,CCR        ;DISABLE CACHE
      032574  004437  002370           JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
      032600  033106            .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                        ;ARE RELOCATED TO HI CACHE SPACE

 5333 032602  052737  000400  177746  2$:     BIS     #FC,CCR         ;FLUSH CACHE TO INVALIDATE ALL CACHE LOCATIONS
 5334 032610  032737  010000  177746  300$:   BIT     #VCIP,CCR       ;WAIT TILL DONE
 5335 032616  001374                   BNE     300$
 5336 032620  005037  000000          1$:     CLR     0               ;0'S TO MAIN MEMORY LOCATION 0.
 5337 032624  112737  000002  177750          MOVB    #HODO,CMR       ;HODO ALLOWS CLOCKING OF PARITY INFO TO
 5338                                                                  ;CME ONLY DURING THE DESTINATION ACCESS OF
 5339                                                                  ;AN INSTRUCTION.
 5340 032632  012737  000015  177746          MOV     #15,CCR         ;NO UCB SO AS TO WRITE CACHE STORES
 5341 032640  005737  000000                  TST     0               ;
 5342 032644  005737  040000                  TST     40000           ;UPDATE CACHE LOCATION 0000 WITH CORRECT PARITY STORAGE
 5343 032650  052737  002000  177746          BIS     #WWPT,CCR       ;ALLOW WRITE WRONG PARITY TO TAGG PARITY STORE
 5344 032656  005737  000000                  TST     0               ;READ UPDATE TO CACHE LOCATION 0000;
 5345                                                                  ;ALL 0'S(EVEN DATA) WILL BE WRITTEN TO DATA/TAG STORES,
 5346                                                                  ;0'S INTO DATA PARITY STORES,AND A 1
 5347                                                                  ;INTO TAG PARITY STORE.
 5348 032662  042737  002000  177746          BIC     #WWPT,CCR       ;DISABLE WWPT
 5349 032670  005037  177744                  CLR     CME             ;CLEAR CME
 5350 032674  005737  000000                  TST     0               ;READ HIT; ALL 0'S WILL BE PLACED ON INPUTS
```

```
                                                                        ;OF DATA PARITY ERROR CHECK PARITY GEN'S, BUT
                                                                        ;TAG PARITY CHECK GENERATOR WILL
                                                                        ;SEE ODD DATA DUE TO WRONG PARITY
                                                                        ;FROM PREVIOUS READ UPDATE.
032700  013700  177744                MOV     CME,R0                  ;SAVE PARITY ERROR BITS WITH PEA CLEARED
032704  052737  000200  177746        BIS     #PEA,CCR                ;SET CCR<7> SO AS TO WRITE CME<7>,<6>,<5> INDIVIDUALLY
                                                                        ;FROM PARITY CHECK LOGIC, AND TO WRITE CME<15>
032712  000240                        NOP
032714  013701  177744                MOV     CME,R1                  ;SAVE CME CONTENTS AFTER PEA IS SET.
                                                                        ;LOOKS LIKE EXPECTED TRAP DID NOT OCCUR.
032720  005037  177744                CLR     CME                     ;CLEAR CME
032724  013702  177744                MOV     CME,R2                  ;SAVE CME CONTENTS AFTER CLEAR
032730  000240                25$:    NOP                             ;INSTRUCTION 'JMP 1$' PLACED HERE
032732  000240                        NOP                             ;FOR  LOOP ON ERROR
032734  012737  001015  177746        MOV     #OFF,CCR                ;DISABLE CACHE
032742  105037  177750                CLRB    CMR                     ;DISABLE MAINT. MODE
032746  012737  000002  000000        MOV     #2,0                    ;RESTORE LOCATION 0
032754  052737  000400  177746        BIS     #FC,CCR                 ;BEFORE LEAVING TEST,FLUSH CACHE TO
                                                                        ;ELIMINATE ANY EFFECTS OF WWPT
032762  032737  010000  177746  4$:   BIT     #VCIP,CCR               ;WAIT TILL DONE
032770  001374                        BNE     4$
032772  022700  000340                CMP     #340,R0                 ;WERE PARITY ERROR BITS CORRECT IN CME
                                                                        ;WITH PEA CLEARED?
032776  001412                        BEQ     7$                      ;YES
033000  012737  000340  047332        MOV     #340,EXDAT6             ;SPECIFY CME CONTENTS EXPECTED
033006  010037  047346                MOV     R0,RECDAT               ;GET CME CONTENTS RECEIVED
033012  104406                        ERROR                           ;ERROR
                                                                        ;-----
033014  033012                        .WORD   .-2
                                                                        ;PARITY CHECK TESTS
                                                                        ;PARITY ERROR BITS DID NOT READ CORRECTLY
                                                                        ;WITH PEA CLEARED
033016  047332                        EXDAT6                          ;PRINT CME CONTENTS EXPECTED
033020  047346                        RECDAT                          ;PRINT CME CONTENTS RECEIVED
033022  000000                        .WORD   0
033024  022701  100040          7$:   CMP     #100040,R1              ;WERE PARITY ERROR BITS CORRECT WITH PEA SET?
033030  001412                        BEQ     8$                      ;YES
033032  012737  100040  047332        MOV     #100040,EXDAT6          ;SPECIFY CME CONTENTS EXPECTED
033040  010137  047346                MOV     R1,RECDAT               ;GET CME CONTENTS RECEIVED
033044  104406                        ERROR                           ;ERROR
                                                                        ;-----
033046  033044                        .WORD   .-2
                                                                        ;PARITY CHECK TESTS
                                                                        ;PARITY ERROR BITS DID NOT READ CORRECTLY
                                                                        ;WITH PEA SET.
033050  047332                        EXDAT6                          ;PRINT CME CONTENTS EXPECTED
033052  047346                        RECDAT                          ;PRINT CME CONTENTS RECEIVED
033054  000000                        .WORD   0
033056  005702                8$:     TST     R2                      ;DID CME CLEAR?
033060  001411                        BEQ     10$                     ;YES
033062  005037  047332                CLR     EXDAT6                  ;SPECIFY CME CONTENTS EXPECTED
033066  010237  047346                MOV     R2,RECDAT               ;GET CME CONTENTS RECEIVED
033072  104406                        ERROR                           ;ERROR
                                                                        ;-----
033074  033072                        .WORD   .-2
                                                                        ;PARITY CHECK TESTS
                                                                        ;PARITY ERROR BITS DID NOT CLEAR
```

TEST # 171 - PARITY ERROR BIT CHECK

```
5401
5402 033076  047332                          EXDAT6                  ;FOLLOWING WRITE TO CME
5403 033100  047346                          RECDAT                  ;PRINT CME CONTENTS EXPECTED
5404 033102  000000                          .WORD   0               ;PRINT CME CONTENTS RECEIVED
5405 033104  000240                  10$:    NOP                     ;END OF TEST
     033106  005237  001472                  INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
TEST # 172 - VERIFY WRONG BYTE INFO CAUSES PROPER PARITY ERROR
   5432                                 .SBTTL  TEST # 172 - VERIFY WRONG BYTE INFO CAUSES PROPER PARITY ERROR
                                        ;;*****************************************************************
                                        ;*TEST 172 - VERIFY WRONG BYTE INFO CAUSES PROPER PARITY ERROR
                                        ;*      VERIFY THE FOLLOWING  WHEN A LOCATION PREVIOUSLY WRITTEN
                                        ;*      WITH WRONG LO & HI BYTE PARITY IS ACCESSED.
                                        ;*              1. A PARITY ERROR IS DETECTED AND ALL PARITY ERROR BITS IN
                                        ;*                 CME READ CORRECTLY WITH PEA CLEARED,
                                        ;*              2.  ALL PARITY ERROR BITS READ CORRECTLY WITH PEA
                                        ;*                 SET.
                                        ;*              3.  A WRITE TO CME CLEARS CME<15> ,<7> AND <6> FROM A 1 STATE
                                        ;*      PROCEDURE:      WRITE WRONG PARITY TO LO BYTE PARITY STORE LOCATION
                                        ;*                      0000. CLOCK PARITY INFO. TO CME.
                                        ;*      CONDITIONS:     HI BYTE PARITY CHECK PARITY GEN. INPUTS:
                                        ;*                        INTD<15:8>=0
                                        ;*                        HI BYTE PARITY BIT=1
                                        ;*                      LO BYTE PAR. CHECK PAR. GEN INPUTS:
                                        ;*                        INTD<7:0>= ALL 0'S
                                        ;*                        LO BYTE PARITY BIT=1
                                        ;*                      TAG PARITY CHECK PARITY GEN. INPUTS:
                                        ;*                        ALL 0'S
                                        ;*      RESULTS:        PEA CLEARED:
                                        ;*                        CME<15>=0
                                        ;*                        CME<7>,<6>,<5>=1
                                        ;*                      PEA SET:
                                        ;*                        CME<15>=1
                                        ;*                        CME<7>,<6>=1
                                        ;*                        CME<5>=0
                                        ;;*****************************************************************
     033112                             TST172:
5433 033112  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     033114  033124                             .WORD   40$             ;TEST START LOCATION
     033116  070016                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     033120  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     033122  070126                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     033124  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     033132  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     033136  033444                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

5434 033140  052737  000400  177746             BIS     #FC,CCR         ;FLUSH CACHE TO INVALIDATE ALL CACHE LOCATIONS
5435 033146  032737  010000  177746  200$:      BIT     #VCIP,CCR       ;WAIT TILL DONE
5436 033154  001374                             BNE     200$
5437 033156  005037  000000             1$:     CLR     0               ;0'S TO MAIN MEMORY LOCATION 0.
5438 033162  112737  000002  177750             MOVB    #HODO,CMR       ;HODO ALLOWS CLOCKING OF PARITY INFO TO
5439                                                                    ;CME ONLY DURING THE DESTINATION ACCESS OF
5440                                                                    ;AN INSTRUCTION.
5441 033170  012737  000015  177746             MOV     #15,CCR         ;NO UCB SO AS TO WRITE CACHE STORES
5442 033176  005737  000000                     TST     0               ;
5443 033202  005737  040000                     TST     40000           ;UPDATE CACHE LOCATION 0000 WITH CORRECT PARITY STORAGE
5444 033206  052737  000100  177746             BIS     #WWPD,CCR       ;ALLOW WRITE WRONG PARITY DATA TO LO
5445                                                                    ;& HI BYTE PARITY STORE.
5446 033214  005737  000000                     TST     0               ;READ UPDATE TO CACHE LOCATION 0000;
5447                                                                    ;ALL 0'S WILL BE WRITTEN TO DATA/TAG STORES,
5448                                                                    ;1'S INTO LO & HI BYTE DATA PARITY STORES,AND A 0
```

```
                                                                        ;INTO TAG PARITY STORE.
5450 033220  042737  000100  177746          BIC     #WWPD,CCR          ;DISABLE WWPD
5451 033226  005037  177744                  CLR     CME                ;CLEAR CME
5452 033232  005737  000000                  TST     0                  ;READ HIT; ALL 0'S(EVEN DATA) WILL BE
5453                                                                    ;PLACED ON INPUTS
5454                                                                    ;OF TAG PARITY ERROR CHECK PARITY GEN'S, BUT
5455                                                                    ;LO & HI BYTE PARITY CHECK GENERATORS WILL
5456                                                                    ;SEE ODD DATA DUE TO WRONG PARITY
5457                                                                    ;FROM PREVIOUS READ UPDATE.
5458 033236  013700  177744                  MOV     CME,R0             ;SAVE PARITY ERROR BITS WITH PEA CLEARED
5459 033242  052737  000200  177746          BIS     #PEA,CCR           ;SET CCR<7> SO AS TO WRITE CME<7>,<6>,<5> INDIVIDUALLY
5460                                                                    ;FROM PARITY CHECK LOGIC, AND TO WRITE CME<15>
5461 033250  000240                          NOP
5462 033252  013701  177744                  MOV     CME,R1             ;SAVE CME CONTENTS AFTER PEA IS SET.
5463                                                                    ;LOOKS LIKE EXPECTED TRAP
5464                                                                    ;DID NOT OCCUR.
5465 033256  005037  177744                  CLR     CME                ;CLEAR CME
5466 033262  013702  177744                  MOV     CME,R2             ;SAVE CME CONTENTS AFTER CLEAR
5467 033266  000240                  25$:    NOP                        ;INSTRUCTION 'JMP 1$' PLACED HERE
     033270  000240                          NOP                        ;FOR  LOOP ON ERROR
5468 033272  012737  001015  177746          MOV     #OFF,CCR           ;DISABLE CACHE
5469 033300  105037  177750                  CLRB    CMR                ;DISABLE MAINT. MODE
5470 033304  012737  000002  000000          MOV     #2,0               ;RESTORE LOCATION 0
5471 033312  052737  000400  177746          BIS     #FC,CCR            ;BEFORE LEAVING TEST FLUSH CACHE TO
5472                                                                    ;ELIMINATE ANY EFFECTS OF WWPD
5473 033320  032737  010000  177746  4$:     BIT     #VCIP,CCR          ;WAIT TILL DONE
5474 033326  001374                          BNE     4$
5475 033330  022700  000340                  CMP     #340,R0            ;WERE PARITY ERROR BITS CORRECT IN CME
5476                                                                    ;WITH PEA CLEARED?
5477 033334  001412                          BEQ     7$                 ;YES
5478 033336  012737  000340  047332          MOV     #340,EXDAT6        ;SPECIFY CME CONTENTS EXPECTED
5479 033344  010037  047346                  MOV     R0,RECDAT          ;GET CME CONTENTS RECEIVED
5480 033350  104406                          ERROR                      ;ERROR
                                                                        ;-----
     033352  033350                          .WORD   .-2
5481                                                                    ;PERITY CHECK TESTS
5482                                                                    ;PARITY ERROR BITS DID NOT READ CORRECTLY
5483                                                                    ;WITH PEA CLEARED
5484 033354  047332                  EXDAT6                             ;PRINT CME CONTENTS EXPECTED
5485 033356  047346                  RECDAT                             ;PRINT CME CONTENTS RECEIVED
5486 033360  000000                          .WORD   0
5487 033362  022701  100300          7$:     CMP     #100300,R1         ;WERE PARITY ERROR BITS CORRECT WITH PEA SET?
5488 033366  001412                          BEQ     8$                 ;YES
5489 033370  012737  100300  047332          MOV     #100300,EXDAT6     ;SPECIFY CME CONTENTS EXPECTED
5490 033376  010137  047346                  MOV     R1,RECDAT          ;GET CME CONTENTS RECEIVED
5491 033402  104406                          ERROR                      ;ERROR
                                                                        ;-----
     033404  033402                          .WORD   .-2
5492                                                                    ;PARITY CHECK TESTS
5493                                                                    ;PARITY ERROR BITS DID NOT READ CORRECTLY
5494                                                                    ;WITH PEA SET.
5495 033406  047332                  EXDAT6                             ;PRINT CME CONTENTS EXPECTED
5496 033410  047346                  RECDAT                             ;PRINT CME CONTENTS RECEIVED
5497 033412  000000                          .WORD   0
5498 033414  005702                  8$:     TST     R2                 ;DID CME CLEAR?
5499 033416  001411                          BEQ     10$                ;YES
5500 033420  005037  047332                  CLR     EXDAT6             ;SPECIFY CME CONTENTS EXPECTED
```

TEST # 172 - VERIFY WRONG BYTE INFO CAUSES PROPER PARITY ERROR

```
 5501 033424  010237  047346              MOV     R2,RECDAT       ;GET CME CONTENTS RECEIVED
 5502 033430  104406                      ERROR                   ;ERROR
                                                                  ;-----
      033432  033430                      .WORD   .-2
 5503                                                             ;PARITY CHECK TESTS
 5504                                                             ;PARITY ERROR BITS DID NOT CLEAR
 5505                                                             ;FOLLOWING WRITE TO CME
 5506 033434  047332                      EXDAT6                  ;PRINT CME CONTENTS EXPECTED
 5507 033436  047346                      RECDAT                  ;PRINT CME CONTENTS RECEIVED
 5508 033440  000000                      .WORD   0
 5509 033442  000240              10$:    NOP                     ;END OF TEST
      033444  005237  001472              INC     $TESTN          ;INCREMENT TEST COUNTER
```

TEST # 173 - INT. LOGIC TRAPS ACCESSING LOC WITH BAD PARITY

```
5517                                    .SBTTL  TEST # 173 - INT. LOGIC TRAPS ACCESSING LOC WITH BAD PARITY
                                        ;;*****************************************************************
                                        ;*TEST 173 - INT. LOGIC TRAPS ACCESSING LOC WITH BAD PARITY
                                        ;*      VERIFY INTERRUPT LOGIC BY ASSURING THAT A TRAP OCCURS TO LOCATION
                                        ;*      114 WHEN A LOCATION PREVIOUSLY WRITTEN
                                        ;*      WITH WRONG HI/LO BYTE PARITY IS ACCESSED.
                                        ;*              CONDITIONS:     PEA=0
                                        ;*                      DCPI=0
                                        ;;*****************************************************************
     033450                             TST173:
5518 033450  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     033452  033462                             .WORD   40$             ;TEST START LOCATION
     033454  070016                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     033456  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     033460  070152                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     033462  012737  001015  177746  40$:      MOV     #OFF,CCR        ;DISABLE CACHE
     033470  004437  002370                    JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     033474  033734                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

5519 033476  052737  000400  177746            BIS     #FC,CCR         ;FLUSH CACHE TO INVALIDATE ALL CACHE LOCATIONS
5520 033504  032737  010000  177746  200$:     BIT     #VCIP,CCR       ;WAIT TILL DONE
5521 033512  001374                            BNE     200$
5522 033514  005037  000000            1$:     CLR     0               ;0'S TO MAIN MEMORY LOCATION 0.
5523 033520  012737  070142  000114            MOV     #4$-40$+67764,114 ;SETUP FOR CACHE TRAP
5524 033526  012737  000340  000116            MOV     #340,116
5525 033534  112737  000002  177750            MOVB    #HODO,CMR       ;HODO ALLOWS CACHE UPDATES
5526                                                                    ;AND CLOCKING OF PARITY INFO TO INTERRUPT LOGIC
5527                                                                    ; ONLY DURING THE DESTINATION ACCESS OF AN INSTRUCTION.
5528 033542  005037  002070                    CLR     FAIL1           ;CLEAR ERROR FLAG
5529 033546  012737  000015  177746            MOV     #15,CCR         ;NO UCB SO AS TO WRITE CACHE STORES
5530 033554  005737  000000                    TST     0               ;
5531 033560  005737  040000                    TST     40000           ;UPDATE CACHE LOCATION 0000 WITH CORRECT PARITY STORAGE
5532 033564  052737  000100  177746            BIS     #WWPD,CCR       ;ALLOW WRITE WRONG PARITY DATA TO LO
5533                                                                    ;& HI BYTE PARITY STORE.
5534 033572  005737  000000                    TST     0               ;READ UPDATE TO CACHE LOCATION 0000;
5535                                                                    ;WRITE WRONG PARITY TO HI/LO BYTE PARITY STORES
5536 033576  042737  000100  177746            BIC     #WWPD,CCR       ;DISABLE WWPD
5537 033604  005037  177744                    CLR     CME             ;CLEAR CME AND PARITY DETECT LOGIC
5538 033610  042737  000005  177746            BIC     #DCPI+FMLO,CCR  ;ALLOW FOR INTERRUPT TO OCCUR
5539                                                                    ;AND ENABLE LOW CACHE
5540 033616  005737  000000                    TST     0               ;READ HIT;
5541                                                                    ;LO & HI BYTE PARITY CHECK GENERATORS WILL
5542                                                                    ; DETECT  WRONG PARITY AND THE PARITY
5543                                                                    ;ERROR WILL BE CLOCKED TO INTERRUPT
5544                                                                    ;LOGIC
5545 033622  000240                            NOP
5546 033624  005237  002070                    INC     FAIL1           ;INDICATE THAT TRAP DID NOT OCCUR
5547 033630  012737  001015  177746            MOV     #OFF,CCR        ;DISABLE CACHE
5548 033636  000404                            BR      25$
5549 033640  012737  001015  177746  4$:       MOV     #OFF,CCR        ;DISABLE CACHE
5550 033646  022626                            CMP     (SP)+,(SP)+     ;READJUST STACK DUE TO INTERRUPT
5551 033650  000240                    25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     033652  000240                            NOP                     ;FOR  LOOP ON ERROR
```

TEST # 173 - INT. LOGIC TRAPS ACCESSING LOC WITH BAD PARITY

```
5552 033654  105037  177750                CLRB    CMR             ;DISABLE MAINT. MODE
5553 033660  012737  000002  000000        MOV     #2,0            ;RESTORE LOCATION 0
5554 033666  012737  000116  000114        MOV     #116,114        ;RESTORE CACHE INTERRUPT VECTORS
5555 033674  005037  000116                CLR     116
5556 033700  052737  000400  177746        BIS     #FC,CCR         ;BEFORE LEAVING TEST FLUSH CACHE TO
5557                                                               ;ELIMINATE ANY EFFECTS OF WWPD
5558 033706  032737  010000  177746  500$:  BIT     #VCIP,CCR       ;WAIT TILL DONE
5559 033714  001374                        BNE     500$
5560 033716  005737  002070                TST     FAIL1           ;DID TRAP OCCUR?
5561 033722  001403                        BEQ     10$             ;YES
5562 033724  104406                        ERROR                   ;ERROR
                                                                   ;-----
     033726  033724                        .WORD   .-2
5563                                                               ;INTERRUPT/ABORT LOGIC TESTS
5564                                                               ;TRAP TO LOCATION 114 DID NOT OCCUR
5565 033730  000000                        .WORD   0
5566 033732  000240                10$:    NOP                     ;END OF TEST
     033734  005237  001472                INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
5574                                    .SBTTL  TEST # 174 - VERIFY INTERRUPT LOGIC TRAP CAN BE INHIBITED
                                        ;;*****************************************************************
                                        ;*TEST 174 - VERIFY INTERRUPT LOGIC TRAP CAN BE INHIBITED
                                        ;*      VERIFY INTERRUPT LOGIC BY ASSURING THAT A TRAP CAN BE INHIBITED TO LOCATION
                                        ;*      114 WHEN A LOCATION PREVIOUSLY WRITTEN
                                        ;*      WITH WRONG HI/LO BYTE PARITY IS ACCESSED.
                                        ;*      CONDITIONS:     PEA=0
                                        ;*                      DCPI=1
                                        ;;*****************************************************************
     033740                             TST174:
5575 033740  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     033742  033752                             .WORD   40$             ;TEST START LOCATION
     033744  070016                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     033746  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     033750  070152                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     033752  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     033760  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     033764  034224                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

5576 033766  052737  000400  177746             BIS     #FC,CCR         ;FLUSH CACHE TO INVALIDATE ALL CACHE LOCATIONS
5577 033774  032737  010000  177746  200$:      BIT     #VCIP,CCR       ;WAIT TILL DONE
5578 034002  001374                             BNE     200$
5579 034004  005037  000000          1$:        CLR     0               ;0'S TO MAIN MEMORY LOCATION 0.
5580 034010  012737  070136  000114             MOV     #4$-40$+67764,114 ;SETUP FOR CACHE TRAP
5581 034016  012737  000340  000116             MOV     #340,116
5582 034024  112737  000002  177750             MOVB    #HODO,CMR       ;HODO ALLOWS CACHE UPDATES
5583                                                                    ;AND CLOCKING OF PARITY INFO TO INTERRUPT LOGIC
5584                                                                    ; ONLY DURING THE DESTINATION ACCESS OF
5585                                                                    ;AN INSTRUCTION.
5586 034032  005037  002070                     CLR     FAIL1           ;CLEAR ERROR FLAG
5587 034036  012737  000015  177746             MOV     #15,CCR         ;NO UCB SO AS TO WRITE CACHE STORES
5588 034044  005737  000000                     TST     0               ;
5589 034050  005737  040000                     TST     40000           ;UPDATE CACHE LOCATION 0000 WITH CORRECT PARITY STORAGE
5590 034054  052737  000100  177746             BIS     #WWPD,CCR       ;ALLOW WRITE WRONG PARITY DATA TO LO
5591                                                                    ;& HI BYTE PARITY STORE.
5592 034062  005737  000000                     TST     0               ;READ UPDATE TO CACHE LOCATION 0000;
5593                                                                    ;WRITE WRONG PARITY TO HI/LO BYTE PARITY STORES
5594 034066  042737  000100  177746             BIC     #WWPD,CCR       ;DISABLE WWPD
5595 034074  005037  177744                     CLR     CME             ;CLEAR CME AND PARITY DETECT LOGIC
5596 034100  042737  000004  177746             BIC     #FMLO,CCR       ;ENABLE LO CACHE
5597 034106  005737  000000                     TST     0               ;READ HIT;
5598                                                                    ;LO & HI BYTE PARITY CHECK GENERATORS WILL
5599                                                                    ; DETECT  WRONG PARITY AND THE PARITY
5600                                                                    ;ERROR WILL BE CLOCKED TO INTERRUPT
5601                                                                    ;LOGIC
5602 034112  000240                             NOP
5603 034114  012737  001015  177746             MOV     #OFF,CCR        ;DISABLE CACHE
5604 034122  000406                             BR      25$
5605 034124  012737  001015  177746  4$:        MOV     #OFF,CCR        ;DISABLE CACHE
5606 034132  005237  002070                     INC     FAIL1           ;INDICATE THAT TRAP OCCURED
5607 034136  022626                             CMP     (SP)+,(SP)+     ;READJUST STACK DUE TO INTERRUPT
5608 034140  000240                  25$:       NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     034142  000240                             NOP                     ;FOR  LOOP ON ERROR
```

TEST # 174 - VERIFY INTERRUPT LOGIC TRAP CAN BE INHIBITED

```
 5609 034144  105037  177750                CLRB    CMR             ;DISABLE MAINT. MODE
 5610 034150  012737  000002  000000        MOV     #2,0            ;RESTORE LOCATION 0
 5611 034156  012737  000116  000114        MOV     #116,114        ;RESTORE CACHE INTERRUPT VECTORS
 5612 034164  005037  000116                CLR     116
 5613 034170  052737  000400  177746        BIS     #FC,CCR         ;BEFORE LEAVING TEST FLUSH CACHE TO
 5614                                                               ;ELIMINATE ANY EFFECTS OF WWPD
 5615 034176  032737  010000  177746  500$:  BIT     #VCIP,CCR       ;WAIT TILL DONE
 5616 034204  001374                BNE     500$
 5617 034206  005737  002070                TST     FAIL1           ;DID TRAP OCCUR?
 5618 034212  001403                BEQ     10$             ;NO
 5619 034214  104406                ERROR                   ;ERROR
                                                            ;-----
      034216  034214                .WORD   .-2
 5620                                                       ;INTERRUPT/ABORT LOGIC TESTS
 5621                                                       ;TRAP TO LOCATION 114  OCCURED
 5622                                                       ;AND WAS NOT INHIBITED BY DCPI
 5623 034220  000000                .WORD   0
 5624 034222  000240          10$:  NOP                     ;END OF TEST
      034224  005237  001472        INC     $TESTN          ;INCREMENT TEST COUNTER
```

TEST # 175 - CME BIT 15 OPERATES PROPERLY & TRAP TO 114 OCCURS

```
                                .SBTTL  TEST # 175 - CME BIT 15 OPERATES PROPERLY & TRAP TO 114 OCCURS
                                ;;*****************************************************************
                                ;*TEST 175 - CME BIT 15 OPERATES PROPERLY & TRAP TO 114 OCCURS
                                ;*      VERIFY ABORT LOGIC BY THE FOLLOWING RESULTS WHEN A LOCATION
                                ;*      PREVIOUSLY WRITTEN WITH WRONG HI/LO BYTE PARITY IS ACCESSED.
                                ;*              1. CME<15> WILL SET CAUSED BY ABORT SIGNAL BEING ASSERTED
                                ;*              2. WRITE TO CME WILL CLEAR CME<15>
                                ;*              3. INSTRUCTION CYCLE WILL BE ABORTED
                                ;*              4. THE ABORT CAUSES TRAP TO 114
                                ;*      PROCEDURE:      INHIBIT CLOCKING OF PARITY ERROR SIGNAL TO
                                ;*                      INTERRUPT LOGIC. ALLOW CME<15> TO BE SET
                                ;*                      BY ABORT SIGNAL WHICH IS ASSERTED BY PARITY
                                ;*                      ERROR SIGNAL TO ABORT LOGIC.
                                ;*      CONDITIONS:     PEA=1
                                ;*                      DCPI=1
                                ;;*****************************************************************
    034230                      TST175:
5640 034230  000004                     SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                 ;ERROR/LOOP ON TEST
     034232  034242                      .WORD   40$             ;TEST START LOCATION
     034234  070016                      .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     034236  000000                      .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     034240  070174                      .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     034242  012737  001015  177746 40$: MOV     #OFF,CCR        ;DISABLE CACHE
     034250  004437  002370              JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     034254  034602                      .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO HI CACHE SPACE

5641 034256  052737  000400  177746     BIS     #FC,CCR         ;FLUSH CACHE TO INVALIDATE ALL CACHE LOCATIONS
5642 034264  032737  010000  177746 200$: BIT     #VCIP,CCR       ;WAIT TILI DONE
5643 034272  001374                     BNE     200$
5644 034274  005037  000000          1$: CLR     0               ;ALL 0'S TO LOCATION 0
5645 034300  005000                     CLR     R0              ;ADDRESS 0 TO R0
5646 034302  012737  070150  000114     MOV     #4$-40$+67764,114 ;SETUP FOR TRAP
5647 034310  012737  000340  000116     MOV     #340,116
5648 034316  112737  000002  177750     MOVB    #HODO,CMR       ;HODO ALLOWS CACHE UPDATES
5649                                                             ;AND CLOCKING OF PARITY INFO TO INTERRUPT LOGIC
5650                                                             ; ONLY DURING THE DESTINATION ACCESS OF
5651                                                             ;AN INSTRUCTION.
5652 034324  005037  002070             CLR     FAIL1           ;CLEAR ERROR FLAG
5653 034330  012703  177777             MOV     #-1,R3          ;ALL 1'S TO R3
5654 034334  012737  000015  177746     MOV     #15,CCR         ;NO UCB SO AS TO WRITE CACHE STORES
5655 034342  005710                     TST     (R0)            ;
5656 034344  005737  040000             TST     40000           ;UPDATE CACHE LOCATION 0000 WITH CORRECT PARITY STORAGE
5657 034350  052737  000100  177746     BIS     #WWPD,CCR       ;ALLOW WRITE WRONG PARITY DATA TO LO
5658                                                             ;& HI BYTE PARITY STORE.
5659 034356  005710                     TST     (R0)            ;READ UPDATE TO CACHE LOCATION 0000
5660                                                             ;WRITE WRONG PARITY TO HI/LO BYTE PARITY STORES
5661 034360  042737  000100  177746     BIC     #WWPD,CCR       ;DISABLE WWPD
5662 034366  005037  177744             CLR     CME             ;CLEAR CME AND PARITY DETECT LOGIC
5663 034372  042737  000004  177746     BIC     #FMLO,CCR       ; ENABLE LOW CACHE
5664 034400  052737  000200  177746     BIS     #PEA,CCR        ;ALLOW FOR ABORT
5665 034406  011003                     MOV     (R0),R3         ;READ HIT;
5666                                                             ;LO & HI BYTE PARITY CHECK GENERATORS WILL
5667                                                             ; DETECT  WRONG PARITY
```

TEST # 175 - CME BIT 15 OPERATES PROPERLY & TRAP TO 114 OCCURS

```
                                                                ;USING HODO AND SOURCE MODE FOR READING
                                                                ;LOCATION 0 WILL INHIBIT PARITY ERROR
                                                                ;FROM BEING CLOCKED TO INTERRUPT LOGIC
                                                                ;HOWEVER, THE PARITY ERROR SIGNAL
                                                                ;WILL CAUSE THE ABORT SIGNAL TO BE
                                                                ;ASSERTED.THE ABORT SIGNAL WILL BE
                                                                ;CAUSE CME<15> TO BE SET.
                                                                ;THIS INSTRUCTION SHOULD BE ABORTED
 5676 034410  000240                        NOP
 5677 034412  005237  002070                INC     FAIL1       ;INDICATE NO TRAP OCCURED
 5678 034416  012737  001015  177746        MOV     #OFF,CCR    ;DISABLE CACHE
 5679 034424  000404                        BR      5$
 5680 034426  012737  001015  177746  4$:   MOV     #OFF,CCR    ;DISABLE CACHE
 5681 034434  022626                        CMP     (SP)+,(SP)+ ;READJUST STACK
 5682 034436  013701  177744          5$:   MOV     CME,R1      ;SAVE CME CONTENTS
 5683 034442  005037  177744                CLR     CME         ;WRITE TO CME
 5684 034446  013702  177744                MOV     CME,R2      ;SAVE CME CONTENTS
 5685 034452  000240                  25$:  NOP                 ;INSTRUCTION 'JMP 1$' PLACED HERE
      034454  000240                        NOP                 ;FOR  LOOP ON ERROR
 5686 034456  105037  177750                CLRB    CMR         ;DISABLE MAINT. MODE
 5687 034462  012737  000002  000000        MOV     #2,0        ;RESTORE VECTORS
 5688 034470  012737  000116  000114        MOV     #116,114
 5689 034476  005037  000116                CLR     116
 5690 034502  052737  000400  177746        BIS     #FC,CCR     ;BEFORE LEAVING TEST FLUSH CACHE TO
 5691                                                           ;ELIMINATE ANY EFFECTS OF WWPD
 5692 034510  032737  010000  177746  6$:   BIT     #VCIP,CCR   ;WAIT TILL DONE
 5693 034516  001374                        BNE     6$
 5694 034520  032701  100000                BIT     #CMPE,R1    ;WAS CME<15> SET?
 5695 034524  001003                        BNE     7$          ;YES; PASS
 5696 034526  104406                        ERROR               ;ERROR
                                                                ;-----
      034530  034526                        .WORD   .-2
 5697                                                           ;!NTERRUPT/ABORT LOGIC
 5698                                                           ;CME<15> WAS NOT SET DUE TO ABORT
 5699                                                           ;SIGNAL
 5700 034532  000000                        .WORD   0
 5701 034534  032702  100000          7$:   BIT     #CMPE,R2    ;WAS CME<15> CLEARED?
 5702 034540  001403                        BEQ     8$          ;YES
 5703 034542  104406                        ERROR               ;ERROR
                                                                ;-----
      034544  034542                        .WORD   .-2
 5704                                                           ;INTERRUPT/ABORT TESTS
 5705                                                           ;CME<15> WAS NOT CLEARED BY WRITE TO
 5706                                                           ; TO CME
 5707 034546  000000                        .WORD   0
 5708 034550  022703  177777          8$:   CMP     #-1,R3      ;WAS INSTRUCTION ABORTED LEAVING R3 INTACT?
 5709 034554  001403                        BEQ     9$          ;YES
 5710 034556  104406                        ERROR               ;ERROR
                                                                ;-----
      034560  034556                        .WORD   .-2
 5711                                                           ;INTERRUPT/ABORT TESTS
 5712                                                           ;R3 WAS OVERWRITTEN WITH DATA INDICATING
 5713                                                           ;THAT INSTRUCTION WAS NOT ABORTED
 5714 034562  000000                        .WORD   0
 5715 034564  005737  002070          9$:   TST     FAIL1       ;DID TRAP OCCUR
 5716 034570  001403                        BEQ     10$         ;YES;PASS
 5717 034572  104406                        ERROR               ;ERROR
```

```
                                                                ;-----
      034574  034572                        .WORD   .-2
 5718                                                           ;INTERRUPT/ABORT TESTS
 5719                                                           ;TRAP DID NOT OCCUR DUE TO ABORT
 5720 034576  000000                        .WORD   0
 5721 034600  000240                 10$:   NOP                 ;END OF TEST
      034602  005237  001472                INC     $TESTN     ;INCREMENT TEST COUNTER
```

```
   5736                                 .SBTTL  TEST # 176 - CHK CACHE TAG/DATA PARITY STORE RAM MEMORY IC'S
                                        ;;*****************************************************************
                                        ;*TEST 176 - CHK CACHE TAG/DATA PARITY STORE RAM MEMORY IC'S
                                        ;*      VERIFY CACHE TAG/DATA PARITY STORE RAM MEMORY IC'S BY PERFORMING A
                                        ;*      MARCH PATTERN TEST TO LOW CACHE AREA OF TAG/DATA PARITY STORE(LOC. 0000-3777)
                                        ;*      PROCEDURE:  1. WRITE ALL 0'S TO ALL LO CACHE TAG/DATA PARITY STORE
                                        ;*                     RAMS CORRESPONDING TO LOCATIONS 0000-3777
                                        ;*                  2. READ 0'S FROM ALL LO CACHE RAMS CORRESPONDING
                                        ;*                     TO LOCATION 0000
                                        ;*                  3. WRITE ALL 1'S TO ALL RAMS CORRESPONDING TO LOCATION
                                        ;*                     0000.
                                        ;*                  4. READ 1'S FROM ALL RAMS CORRESPONDING TO LOCATION
                                        ;*                     0000.
                                        ;*                  5. REPEAT SREPS 2 THRU 4 WITH NEXT LOCATION
                                        ;*                     AND UNTIL LOC. 3777 IS REACHED.
                                        ;;*****************************************************************
        034606                          TST176:
   5737 034606  000004                          SCPCND                          ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                                ;ERROR/LOOP ON TEST
        034610  034620                          .WORD   40$                     ;TEST START LOCATION
        034612  070000                          .WORD   1$-40$+67764            ;LOOP ON ERROR START LOCATION
        034614  000000                          .WORD   0                       ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
        034616  070126                          .WORD   25$-40$+67764           ;LOOP ON ERROR END LOCATION
        034620  012737  001015  177746  40$:    MOV     #OFF,CCR                ;DISABLE CACHE
        034626  004437  002370                  JSR     R4,RELCTH               ;LOCATE TEST CODE TO HIGH CACHE SPACE
        034632  035234                          .WORD   10$+2                   ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

   5738 034634  012702  000401          1$:     MOV     #401,R2                 ;SETUP R2 WITH PATTERN 401
   5739 034640  005037  177752                  CLR     CHR                     ;LOAD AMR<8:0> WITH ALL 0'S
   5740 034644  012700  060000                  MOV     #60000,R0               ;ADDRESS 60000 TO R0
   5741 034650  005020                  2$:     CLR     (R0)+                   ;CLEAR ALL LOW CACHE MAIN MEMORY
   5742 034652  020027  070000                  CMP     R0,#70000
   5743 034656  001374                          BNE     2$
   5744 034660  012700  060000                  MOV     #60000,R0               ;1ST ADDRESS LOCATION IN R0
   5745 034664  012701  040000                  MOV     #40000,R1               ;ADDRESS 40000 IN R1
   5746 034670  112737  000003  177750          MOVB    #HODO+TDAR,CMR          ;HODO ALLOWS CACHE UPDATES &  DATA /TAG PARITY
   5747                                                                         ; STORE BITS TO BE WRITTEN TO
   5748                                                                         ;CMR<11:9> ONLY DURING THE  DESTINATION
   5749                                                                         ;ACCESS OF AN INSTRUCTION.
   5750                                                                         ;TDAR ALLOWS TAG PARITY STORE GENERATOR
   5751                                                                         ;INPUTS TO BE LOADED FROM AMR<8:0>
   5752 034676  012737  000015  177746          MOV     #15,CCR                 ;NO UCB SO AS TO WRITE ENABLE PARITY STORE
   5753 034704  005721                  6$:     TST     (R1)+                   ;
   5754 034706  005720                          TST     (R0)+                   ;WRITE 0'S INTO ALL DATA/TAG PARITY STORE
   5755                                                                         ;ADDRESS LOCATIONS SPECIFIED BY R0
   5756 034710  022700  070000                  CMP     #70000,R0               ;DONE?
   5757 034714  001373                          BNE     6$                      ;NO
   5758 034716  012737  000001  177752          MOV     #1,CHR                  ;LOAD AMR<8:0> BY WRITING TO CHR<8:0>
   5759 034724  012700  060000                  MOV     #60000,R0               ;ADDR. 60000 TO R0
   5760 034730  042737  000001  177750  7$:     BIC     #TDAR,CMR               ;DISABLE TDAR TO ALLOW UPDATE
   5761                                                                         ;OF CACHE TAG STORE THRU CA<21:13>
   5762 034736  005710                          TST     (R0)                    ;READ MISS TO CACHE LOCATION SPECIFIED
   5763                                                                         ;BY R0.  CLOCK TAG/DATA PARITY STORE
   5764                                                                         ;BITS INTO CMR<11:9>.SHOULD BE ALL 0'S.
```

```
                                                                                ;ALSO CAUSES UPDATE TO CACHE.TAG/DATA
                                                                                ;PARITY STORE LOCATION SHOULD REMAIN
                                                                                ;WITH 0'S.
 034740  013705  177750                    MOV     CMR,R5                       ;SAVE CMR CONTENTS
 034744  052737  000001  177750            BIS     #TDAR,CMR                    ;ENABLE TDAR TO ALLOW TAG PARITY GENERATOR
                                                                                ;INPUTS TO SEE ODD DATA FROM AMR<8:0>
 034752  010210                            MOV     R2,(R0)                      ;WRITE HIT CAUSES UPDATE TO CACHE.
                                                                                ;TAG/DATA PARITY STORES WILL BE WRITTEN
                                                                                ;WITH 1'S DUE TO AMR<8:0> ODD DATA
                                                                                ;AND PATTERN 401 FROM R2 BEING PUT
                                                                                ;ONTO PAX DATA LINES RESULTING IN
                                                                                ;ODD DATA FOR LO AND HI BYTE DATA PARITY GENERATORS.
 034754  005710                            TST     (R0)                         ;READ MISS.CLOCK TAG/DATA PARITY STORE BITS TO
                                                                                ;CMR<11:9>.SHOULD BE ALL 1'S.
 034756  013703  177750                    MOV     CMR,R3                       ;SAVE CMR CONTENTS
 034762  000240                    25$:    NOP                                  ;INSTRUCTION 'JMP 1$' PLACED HERE
 034764  000240                            NOP                                  ;FOR  LOOP ON ERROR
 034766  042705  170777                    BIC     #170777,R5                   ;INTERESTED IN BITS 11:9
 034772  005705                            TST     R5                           ;BITS 11:9 SHOULD BE ALL 0'S
 034774  001437                            BEQ     8$                           ;PASS
 034776  012737  001015  177746            MOV     #OFF,CCR                     ;DISABLE CACHE
 035004  105037  177750                    CLRB    CMR                          ;CLEAR MAINT. MODE
 035010  005037  047336                    CLR     EXDAT1                       ;SPECIFY EXPECTED CACHE TAG/DATA PARITY STORE DATA
 035014  010537  047354                    MOV     R5,CMR119                    ;SPECIFY CACHE TAG/DATA PARITY STORE DATA RECEIVED
                                                                                ;THRU CMR<11:9>
 035020  012737  000011  002062            MOV     #9.,LOOP                     ;PREPARE CMR119 FOR TYPEOUT
 035026  006237  047354            11$:    ASR     CMR119
 035032  042737  100000  047354            BIC     #100000,CMR119
 035040  005337  002062                    DEC     LOOP
 035044  001370                            BNE     11$
 035046  010037  047334                    MOV     R0,CA121                     ;SPECIFY FAILED TAG/DATA PARITY STORE ADDRESS LOCATION
 035052  006237  047334                    ASR     CA121
 035056  104406                            ERROR                                ;ERROR
                                                                                ;-----
 035060  035056                            .WORD   .-2
                                                                                ;TAG/DATA PARITY STORE MARCH PATTERN TEST
                                                                                ;READING CACHE TAG/DATA PARITY STORE DATA
                                                                                ;THRU CMR<11:9> DID NOT READ ALL 0'S.
                                                                                ;THIS SUGGESTS THAT A RAM LOCATION
                                                                                ;SPECIFIED BY CA121 WAS OVERWRITTEN
                                                                                ;WITH A 1 WHEN WRITING A 1 TO ANOTHER
                                                                                ;LOCATION.ANY BIT IN CMR119 DATA
                                                                                ;THAT IS A 1 MAY POINT TO A BAD
                                                                                ;CACHE TAG/DATA PARITY STORE RAM.
 035062  047336                            EXDAT1                               ;PRINT  EXPECTED CACHE TAG/DATA PARITY STORE DATA
 035064  047354                            CMR119                               ;PRINT  CACHE TAG/DATA PARITY STORE RECEIVED
                                                                                ;THRU CMR<11:9>
 035066  047334                            CA121                                ;SPECIFY FAILED TAG/DATA PARITY STORE ADDRESS LOCATION
 035070  000000                            .WORD   0
 035072  000452                            BR      3$                           ;END THE TEST
 035074  042703  170777            8$:     BIC     #170777,R3                   ;INTERESTED IN BITS 11:9 ONLY
 035100  022703  007000                    CMP     #7000,R3                     ;BITS 11:9 SHOULD BE ALL 1'S
 035104  001440                            BEQ     9$                           ;PASS
 035106  012737  001015  177746            MOV     #OFF,CCR                     ;DISABLE CACHE
 035114  105037  177750                    CLRB    CMR                          ;CLEAR MAINT. MODE
 035120  012737  000007  047336            MOV     #7,EXDAT1                    ;SPECIFY EXPECTED CACHE TAG/DATA PARITY STORE DATA
```

```
 5819 035126  010337  047354                MOV     R3,CMR119       ;SPECIFY CACHE TAG/DATA PARITY STORE DATA READ
 5820                                                                 ;THRU CMR<11:9>
 5821 035132  012737  000011  002062        MOV     #9.,LOOP        ;PREPARE CMR119 FOR TYPEOUT
 5822 035140  006237  047354          12$:  ASR     CMR119
 5823 035144  042737  100000  047354        BIC     #100000,CMR119
 5824 035152  005337  002062                DEC     LOOP
 5825 035156  001370                        BNE     12$
 5826 035160  010037  047334                MOV     R0,CA121        ;SPECIFY FAILED TAG/DATA PARITY STORE ADDRESS LOCATION
 5827 035164  006237  047334                ASR     CA121
 5828 035170  104406                        ERROR                   ;ERROR
                                                                     ;-----
      035172  035170                        .WORD   .-2
 5829                                                                ;TAG/DATA PARITY STORE MARCH PATTERN TEST
 5830                                                                ;READING CACHE TAG/DATA PARITY STORE DATA
 5831                                                                ;THRU CMR<11:9> DID NOT READ ALL 1'S.
 5832                                                                ;ANY BIT IN CMR119 DATA
 5833                                                                ;THAT IS A 0 MAY POINT TO A BAD
 5834                                                                ;CACHE TAG/DATA PARITY STORE RAM.
 5835 035174  047336                        EXDAT1                  ;PRINT  EXPECTED CACHE TAG/DATA PARITY STORE DATA
 5836 035176  047354                        CMR119                  ;PRINT CACHE TAG/DATA PARITY STORE DATA READ
 5837                                                                ;THRU CMR<11:9>
 5838 035200  047334                        CA121                   ;SPECIFY FAILED TAG/DATA PARITY STORE ADDRESS LOCATION
 5839 035202  000000                        .WORD   0
 5840 035204  000405                        BR      3$              ;END TEST
 5841 035206  062700  000002          9$:   ADD     #2,R0           ;NEXT LOCATION
 5842 035212  022700  070000                CMP     #70000,R0       ;HAS ALL LO CACHE BEEN DONE?
 5843 035216  001244                        BNE     7$              ;NO,CONTINUE
 5844 035220  012737  001015  177746  3$:   MOV     #OFF,CCR        ;DISABLE CACHE
 5845 035226  105037  177750                CLRB    CMR             ;DISABLE MAINT. MODE
 5846 035232  000240                  10$:  NOP                     ;END OF TEST
      035234  005237  001472                INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
5861                                    .SBTTL  TEST # 177 - CHK CACHE TAG/DATA PARITY STORE RAM MEMORY IC'S
                                        ;;*****************************************************************
                                        ;*TEST 177 - CHK CACHE TAG/DATA PARITY STORE RAM MEMORY IC'S
                                        ;*      VERIFY CACHE TAG/DATA PARITY STORE RAM MEMORY IC'S BY PERFORMING A
                                        ;*      MARCH PATTERN TEST TO HIGH CACHE AREA OF TAG/DATA PARITY STORE(LOC. 4000-7777)
                                        ;*      PROCEDURE:  1. WRITE ALL 0'S TO ALL HI CACHE TAG/DATA PARITY STORE
                                        ;*                     RAMS CORRESPONDING TO LOCATIONS 4000-7777
                                        ;*                  2. READ 0'S FROM ALL HI CACHE RAMS CORRESPONDING
                                        ;*                     TO LOCATION 4000
                                        ;*                  3. WRITE ALL 1'S TO ALL RAMS CORRESPONDING TO LOCATION
                                        ;*                     4000
                                        ;*                  4. READ 1'S FROM ALL RAMS CORRESPONDING TO LOCATION
                                        ;*                     4000
                                        ;*                  5. REPEAT SREPS 2 THRU 4 WITH NEXT LOCATION
                                        ;*                     AND UNTIL LOC. 7777 IS REACHED.
                                        ;;*****************************************************************
     035240                             TST177:
5862 035240  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     035242  035252                             .WORD   40$             ;TEST START LOCATION
     035244  060000                             .WORD   1$-40$+57764    ;LOOP ON ERROR START LOCATION
     035246  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     035250  060126                             .WORD   25$-40$+57764   ;LOOP ON ERROR END LOCATION
     035252  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     035260  004437  002342                     JSR     R4,RELCTL       ;LOCATE TEST CODE TO LOW CACHE SPACE
     035264  035666                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO LOW CACHE SPACE

5863 035266  012702  000401             1$:     MOV     #401,R2         ;SETUP R2 WITH PATTERN 401
5864 035272  005037  177752                     CLR     CHR             ;LOAD AMR<8:0> WITH ALL 0'S
5865 035276  012700  070000                     MOV     #70000,R0       ;ADDRESS 70000 TO R0
5866 035302  005020                     2$:     CLR     (R0)+           ;CLEAR ALL HIGH CACHE MAIN MEMORY
5867 035304  020027  100000                     CMP     R0,#100000
5868 035310  001374                             BNE     2$
5869 035312  012700  070000                     MOV     #70000,R0       ;1ST ADDRESS LOCATION IN R0
5870 035316  012701  050000                     MOV     #50000,R1       ;ADDRESS 50000 IN R1
5871 035322  112737  000003  177750             MOVB    #HODO+TDAR,CMR  ;HODO ALLOWS CACHE UPDATES &  DATA /TAG PARITY
5872                                                                    ; STORE BITS TO BE WRITTEN TO
5873                                                                    ;CMR<11:9> ONLY DURING THE  DESTINATION
5874                                                                    ;ACCESS OF AN INSTRUCTION.
5875                                                                    ;TDAR ALLOWS TAG PARITY STORE GENERATOR
5876                                                                    ;INPUTS TO BE LOADED FROM AMR<8:0>
5877 035330  012737  000015  177746             MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE PARITY STORE
5878 035336  005721                     6$:     TST     (R1)+           ;
5879 035340  005720                             TST     (R0)+           ;WRITE 0'S INTO ALL DATA/TAG PARITY STORE
5880                                                                    ;ADDRESS LOCATIONS SPECIFIED BY R0
5881 035342  022700  100000                     CMP     #100000,R0      ;DONE?
5882 035346  001373                             BNE     6$              ;NO
5883 035350  012737  000001  177752             MOV     #1,CHR          ;LOAD AMR<8:0> BY WRITING TO CHR<8:0>
5884 035356  012700  070000                     MOV     #70000,R0       ;ADDR. 70000 TO R0
5885 035362  042737  000001  177750  7$:        BIC     #TDAR,CMR       ;DISABLE TDAR TO  ALLOW  UPDATE
5886                                                                    ;OF CACHE TAG STORE THRU CA<21:13>
5887 035370  005710                             TST     (R0)            ;READ MISS TO CACHE LOCATION SPECIFIED
5888                                                                    ;BY R0.  CLOCK TAG/DATA PARITY STORE
5889                                                                    ;BITS INTO CMR<11:9>.SHOULD BE ALL 0'S.
```

TEST # 177 - CHK CACHE TAG/DATA PARITY STORE RAM MEMORY IC'S

```
                                                                        ;ALSO CAUSES UPDATE TO CACHE.TAG/DATA
                                                                        ;PARITY STORE LOCATION SHOULD REMAIN
                                                                        ;WITH 0'S.
 035372  013705  177750                MOV     CMR,R5                 ;SAVE CMR CONTENTS
 035376  052737  000001  177750        BIS     #TDAR,CMR              ;ENABLE TDAR TO  ALLOW  TAG PARITY GENERATOR
                                                                        ;INPUTS TO SEE ODD DATA FROM AMR<8:0>
 035404  010210                        MOV     R2,(R0)                ;WRITE HIT CAUSES UPDATE TO CACHE.
                                                                        ;TAG/DATA PARITY STORES WILL BE WRITTEN
                                                                        ;WITH 1'S DUE TO AMR<8:0> ODD DATA
                                                                        ;AND PATTERN 401 FROM R2 BEING PUT
                                                                        ;ONTO PAX DATA LINES RESULTING IN
                                                                        ;ODD DATA FOR LO AND HI BYTE DATA PARITY
                                                                        ;GENERATORS.
 035406  005710                        TST     (R0)                   ;READ MISS.CLOCK TAG/DATA PARITY STORE BITS TO
                                                                        ;CMR<11:9>.SHOULD BE ALL 1'S.
 035410  013703  177750                MOV     CMR,R3                 ;SAVE CMR CONTENTS
 035414  000240                25$:    NOP                            ;INSTRUCTION 'JMP 1$' PLACED HERE
 035416  000240                        NOP                            ;FOR  LOOP ON ERROR
 035420  042705  170777                BIC     #170777,R5             ;INTERESTED IN BITS 11:9
 035424  005705                        TST     R5                     ;BITS 11:9 SHOULD BE ALL 0'S
 035426  001437                        BEQ     8$                     ;PASS
 035430  012737  001015  177746        MOV     #OFF,CCR               ;DISABLE CACHE
 035436  105037  177750                CLRB    CMR                    ;CLEAR MAINT. MODE
 035442  005037  047336                CLR     EXDAT1                 ;SPECIFY EXPECTED CACHE TAG/DATA PARITY STORE DATA
 035446  010537  047354                MOV     R5,CMR119              ;SPECIFY CACHE TAG/DATA PARITY STORE DATA RECEIVED
                                                                        ;THRU CMR<11:9>
 035452  012737  000011  002062        MOV     #9.,LOOP               ;PREPARE CMR119 FOR TYPEOUT
 035460  006237  047354        11$:    ASR     CMR119
 035464  042737  100000  047354        BIC     #100000,CMR119
 035472  005337  002062                DEC     LOOP
 035476  001370                        BNE     11$
 035500  010037  047334                MOV     R0,CA121               ;SPECIFY FAILED TAG/DATA PARITY STORE ADDRESS LOCATION
 035504  006237  047334                ASR     CA121
 035510  104406                        ERROR                          ;ERROR
                                                                        ;-----
 035512  035510                        .WORD   .-2
                                                                        ;TAG/DATA PARITY STORE MARCH PATTERN TEST
                                                                        ;READING CACHE TAG/DATA PARITY STORE DATA
                                                                        ;THRU CMR<11:9> DID NOT READ ALL 0'S.
                                                                        ;THIS SUGGESTS THAT A RAM LOCATION
                                                                        ;SPECIFIED BY CA121 WAS OVERWRITTEN
                                                                        ;WITH A 1 WHEN WRITING A 1 TO ANOTHER
                                                                        ;LOCATION.ANY BIT IN CMR119 DATA
                                                                        ;THAT IS A 1 MAY POINT TO A BAD
                                                                        ;CACHE TAG/DATA PARITY STORE RAM.
 035514  047336                        EXDAT1                         ;PRINT  EXPECTED CACHE TAG/DATA PARITY STORE DATA
 035516  047354                        CMR119                         ;PRINT  CACHE TAG/DATA PARITY STORE RECEIVED
                                                                        ;THRU CMR<11:9>
 035520  047334                        CA121                          ;SPECIFY FAILED TAG/DATA PARITY STORE ADDRESS LOCATION
 035522  000000                        .WORD   0
 035524  000452                        BR      3$                     ;END THE TEST
 035526  042703  170777        8$:     BIC     #170777,R3             ;INTERESTED IN BITS 11:9 ONLY
 035532  022703  007000                CMP     #7000,R3               ;BITS 11:9 SHOULD BE ALL 1'S
 035536  001440                        BEQ     9$                     ;PASS
 035540  012737  001015  177746        MOV     #OFF,CCR               ;DISABLE CACHE
 035546  105037  177750                CLRB    CMR                    ;CLEAR MAINT. MODE
```

```
5944 035552  012737  000007  047336          MOV     #7,EXDAT1       ;SPECIFY EXPECTED CACHE TAG/DATA PARITY STORE DATA
5945 035560  010337  047354                  MOV     R3,CMR119       ;SPECIFY CACHE TAG/DATA PARITY STORE DATA READ
5946                                                                 ;THRU CMR<11:9>
5947 035564  012737  000011  002062          MOV     #9.,LOOP        ;PREPARE CMR119 FOR TYPEOUT
5948 035572  006237  047354          12$:    ASR     CMR119
5949 035576  042737  100000  047354          BIC     #100000,CMR119
5950 035604  005337  002062                  DEC     LOOP
5951 035610  001370                          BNE     12$
5952 035612  010037  047334                  MOV     R0,CA121        ;SPECIFY FAILED TAG/DATA PARITY STORE ADDRESS LOCATION
5953 035616  006237  047334                  ASR     CA121
5954 035622  104406                          ERROR                   ;ERROR
                                                                     ;-----
     035624  035622                          .WORD   .-2
5955                                                                 ;TAG/DATA PARITY STORE MARCH PATTERN TEST
5956                                                                 ;READING CACHE TAG/DATA PARITY STORE DATA
5957                                                                 ;THRU CMR<11:9> DID NOT READ ALL 1'S.
5958                                                                 ;ANY BIT IN CMR119 DATA
5959                                                                 ;THAT IS A 0 MAY POINT TO A BAD
5960                                                                 ;CACHE TAG/DATA PARITY STORE RAM.
5961
5962 035626  047336                          EXDAT1                  ;PRINT  EXPECTED CACHE TAG/DATA PARITY STORE DATA
5963 035630  047354                          CMR119                  ;PRINT CACHE TAG/DATA PARITY STORE DATA READ
5964                                                                 ;THRU CMR<11:9>
5965 035632  047334                          CA121                   ;SPECIFY FAILED TAG/DATA PARITY STORE ADDRESS LOCATION
5966 035634  000000                          .WORD   0
5967 035636  000405                          BR      3$              ;END TEST
5968 035640  062700  000002          9$:     ADD     #2,R0           ;NEXT LOCATION
5969 035644  022700  100000                  CMP     #100000,R0      ;HAS ALL HI CACHE BEEN DONE?
5970 035650  001244                          BNE     7$              ;NO,CONTINUE
5971 035652  012737  001015  177746  3$:     MOV     #OFF,CCR        ;DISABLE CACHE
5972 035660  105037  177750                  CLRB    CMR             ;DISABLE MAINT. MODE
5973 035664  000240                  10$:    NOP                     ;END OF TEST
     035666  005237  001472                  INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 200 - VERIFY CACHE VALID STORE RAM MEMORY IC'S
                                ;;*****************************************************************
                                ;*TEST 200 - VERIFY CACHE VALID STORE RAM MEMORY IC'S
                                ;*      VERIFY CACHE VALID STORE RAM MEMORY IC'S BY PERFORMING A
                                ;*      MARCH PATTERN TEST TO LOW CACHE AREA OF VALID STORE(LOC. 0000-3777)
                                ;*      PROCEDURE:  1. WRITE 0'S  TO LO CACHE VALID STORE
                                ;*                     RAM CORRESPONDING TO LOCATIONS 0000-3777
                                ;*                  2. READ 0 FROM  LO CACHE RAM CORRESPONDING
                                ;*                     TO LOCATION 0000
                                ;*                  3. WRITE  1 TO  RAM CORRESPONDING TO LOCATION
                                ;*                     0000.
                                ;*                  4. READ 1 FROM  RAM CORRESPONDING TO LOCATION
                                ;*                     0000.
                                ;*                  5. REPEAT SREPS 2 THRU 4 WITH NEXT LOCATION
                                ;*                     AND UNTIL LOC. 3777 IS REACHED.
                                ;;*****************************************************************
     035672                     TST200:
5989 035672  000004                        SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                   ;ERROR/LOOP ON TEST
     035674  035704                        .WORD   40$             ;TEST START LOCATION
     035676  070026                        .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     035700  000000                        .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     035702  070136                        .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     035704  012737  001015  177746  40$:  MOV     #OFF,CCR        ;DISABLE CACHE
     035712  004437  002370                JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     035716  036222                        .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO HI CACHE SPACE

5990 035720  032737  020000  177746        BIT     #VSIU,CCR       ;IS SET A USED
5991 035726  001407                        BEQ     1$              ;YES
5992 035730  052737  000400  177746        BIS     #FC,CCR         ;FLUSH
5993 035736  032737  010000  177746  200$: BIT     #VCIP,CCR
5994 035744  001374                        BNE     200$
5995 035746  012700  060000          1$:   MOV     #60000,R0       ;1ST ADDRESS LOCATION IN R0
5996 035752  012701  040000                MOV     #40000,R1       ;ADDRESS 40000 IN R1
5997 035756  005002                        CLR     R2
5998 035760  112737  000002  177750        MOVB    #HODO,CMR       ;HODO ALLOWS CACHE UPDATES &  VALID
5999                                                               ; STORE BITS TO BE WRITTEN TO
6000                                                               ;CMR<12> ONLY DURING THE  DESTINATION
6001                                                               ;ACCESS OF AN INSTRUCTION.
6002                                                               ;STORE
6003 035766  012737  000015  177746        MOV     #15,CCR         ;NO UCB SO AS TO UPDATE VALID STORE
6004 035774  005721                6$:     TST     (R1)+           ;
6005 035776  005720                        TST     (R0)+           ;UPDATE ALL LO CACHE VALID STORE
6006                                                               ;ADDRESS LOCATIONS SPECIFIED BY R0
6007 036000  022700  070000                CMP     #70000,R0       ;DONE?
6008 036004  001373                        BNE     6$              ;NO
6009 036006  012700  060000                MOV     #60000,R0       ;ADDR. 60000 TO R0
6010 036012  052737  001000  177746        BIS     #UCB,CCR        ;ENABLE UCB
6011 036020  010220                13$:    MOV     R2,(R0)+        ;WRITE HIT WITH UCB WILL INVALIDATE
6012                                                               ;OR WRITE 0 TO ALL LO CACHE VALID STORE
6013 036022  022700  070000                CMP     #70000,R0       ;DONE?
6014 036026  001374                        BNE     13$             ;NO
6015 036030  042737  001000  177746        BIC     #UCB,CCR        ;DISABLE UCB SO AS TO ALLOW VALID STORE UPDATES
6016 036036  012700  060000                MOV     #60000,R0       ;ADDRESS 60000 TO R0
```

```
TEST # 200 - VERIFY CACHE VALID STORE RAM MEMORY IC'S
   6017 036042  005710                    7$:     TST     (R0)            ;READ MISS TO CACHE LOCATION SPECIFIED
   6018                                                                   ;BY R0.  CLOCK VALID STORE
   6019                                                                   ;BIT INTO CMR<12>.SHOULD BE 0.
   6020                                                                   ;ALSO CAUSES UPDATE TO CACHE.
   6021                                                                   ;VALID STORE LOCATION WILL BE WRITTEN WITH A 1.
   6022 036044  013705  177750                MOV     CMR,R5          ;SAVE CMR CONTENTS
   6023 036050  005710                        TST     (R0)            ;READ HIT.CLOCK VALID STORE BIT TO CMR<12> SHOULD BE 1.
   6024 036052  013703  177750                MOV     CMR,R3          ;SAVE CMR CONTENTS
   6025 036056  000240                  25$:  NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
        036060  000240                        NOP                     ;FOR  LOOP ON ERROR
   6026 036062  042705  167777                BIC     #167777,R5      ;INTERESTED IN BIT 12
   6027 036066  005705                        TST     R5              ;BIT 12 SHOULD BE 0
   6028 036070  001416                        BEQ     8$              ;PASS
   6029 036072  012737  001015  177746        MOV     #OFF,CCR        ;DISABLE CACHE
   6030 036100  105037  177750                CLRB    CMR             ;CLEAR MAINT. MODE
   6031 036104  010037  047334                MOV     R0,CA121        ;SPECIFY FAILED VALID STORE ADDRESS LOCATION
   6032 036110  006237  047334                ASR     CA121
   6033 036114  104406                        ERROR                   ;ERROR
                                                                       ;-----
        036116  036114                        .WORD   .-2
   6034                                                                ;VALID STORE MARCH PATTERN TEST- SET A
   6035                                                                ;READING CACHE VALID STORE DATA
   6036                                                                ;THRU CMR<12> DID NOT READ  0.
   6037                                                                ;THIS SUGGESTS THAT A RAM LOCATION
   6038                                                                ;SPECIFIED BY CA121 WAS OVERWRITTEN
   6039                                                                ;WITH A 1 WHEN WRITING A 1 TO ANOTHER
   6040                                                                ;LOCATION.
   6041                                                                ;THIS INDICATES THAT VALID STORE RAM
   6042                                                                ;SET A IS BAD.
   6043
   6044 036120  047334                        CA121                   ;SPECIFY FAILED VALID STORE ADDRESS LOCATION
   6045 036122  000000                        .WORD   0
   6046 036124  000430                        BR      3$              ;END THE TEST
   6047 036126  042703  167777          8$:   BIC     #167777,R3      ;INTERESTED IN BIT 12 ONLY
   6048 036132  022703  010000                CMP     #10000,R3       ;BIT 12 SHOULD BE 1
   6049 036136  001416                        BEQ     9$              ;PASS
   6050 036140  012737  001015  177746        MOV     #OFF,CCR        ;DISABLE CACHE
   6051 036146  105037  177750                CLRB    CMR             ;CLEAR MAINT. MODE
   6052 036152  010037  047334                MOV     R0,CA121        ;SPECIFY FAILED VALID STORE ADDRESS LOCATION
   6053 036156  006237  047334                ASR     CA121
   6054 036162  104406                        ERROR                   ;ERROR
                                                                       ;-----
        036164  036162                        .WORD   .-2
   6055                                                                ;VALID STORE MARCH PATTERN TEST- SET A
   6056                                                                ;READING CACHE VALID STORE DATA
   6057                                                                ;THRU CMR<12> DID NOT READ  1.
   6058                                                                ;THIS SUGGESTS THAT VALID STORE RAM
   6059                                                                ;IC SET A IS BAD.
   6060                                                                ;THRU CMR<12>
   6061 036166  047334                        CA121                   ;SPECIFY FAILED VALID STORE ADDRESS LOCATION
   6062 036170  000000                        .WORD   0
   6063 036172  000405                        BR      3$              ;END TEST
   6064 036174  062700  000002          9$:   ADD     #2,R0           ;NEXT LOCATION
   6065 036200  022700  070000                CMP     #70000,R0       ;HAS ALL LO CACHE BEEN DONE?
   6066 036204  001316                        BNE     7$              ;NO,CONTINUE
   6067 036206  012737  001015  177746  3$:   MOV     #OFF,CCR        ;DISABLE CACHE
   6068 036214  105037  177750                CLRB    CMR             ;DISABLE MAINT. MODE
```

```
 6069 036220  000240                  10$:    NOP                     ;END OF TEST
      036222  005237  001472                  INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 201 - VERIFY CACHE VALID STORE RAM MEMORY IC'S
                                ;;*****************************************************************
                                ;*TEST 201 - VERIFY CACHE VALID STORE RAM MEMORY IC'S
                                ;*      VERIFY CACHE VALID STORE RAM MEMORY IC'S BY PERFORMING A
                                ;*      MARCH PATTERN TEST TO HIGH CACHE AREA OF VALID STORE(LOC. 4000-7777)
                                ;*      PROCEDURE:  1. WRITE 0'S  TO HI CACHE VALID STORE
                                ;*                     RAM CORRESPONDING TO LOCATIONS 4000-7777
                                ;*                  2. READ 0 FROM  HI CACHE RAM CORRESPONDING
                                ;*                     TO LOCATION 4000
                                ;*                  3. WRITE  1 TO  RAM CORRESPONDING TO LOCATION
                                ;*                     4000
                                ;*                  4. READ 1 FROM  RAM CORRESPONDING TO LOCATION
                                ;*                     4000
                                ;*                  5. REPEAT SREPS 2 THRU 4 WITH NEXT LOCATION
                                ;*                     AND UNTIL LOC. 7777 IS REACHED.
                                ;;*****************************************************************
     036226
6085 036226  000004                TST201:  SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                    ;ERROR/LOOP ON TEST
     036230  036240                         .WORD   40$             ;TEST START LOCATION
     036232  060026                         .WORD   1$-40$+57764    ;LOOP ON ERROR START LOCATION
     036234  000000                         .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     036236  060136                         .WORD   25$-40$+57764   ;LOOP ON ERROR END LOCATION
     036240  012737  001015  177746 40$:    MOV     #OFF,CCR        ;DISABLE CACHE
     036246  004437  002342                JSR     R4,RELCTL       ;LOCATE TEST CODE TO LOW CACHE SPACE
     036252  036556                        .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO LOW CACHE SPACE

6086 036254  032737  020000  177746        BIT     #VSIU,CCR       ;IS SET A USED
6087 036262  001407                        BEQ     1$              ;YES
6088 036264  052737  000400  177746        BIS     #FC,CCR         ;FLUSH
6089 036272  032737  010000  177746 200$:  BIT     #VCIP,CCR
6090 036300  001374                        BNE     200$
5091 036302  012700  070000         1$:    MOV     #70000,R0       ;1ST ADDRESS LOCATION IN R0
6092 036306  012701  050000                MOV     #50000,R1       ;ADDRESS 50000 IN R1
6093 036312  005002                        CLR     R2
6094 036314  112737  000002  177750        MOVB    #HODO,CMR       ;HODO ALLOWS CACHE UPDATES &  VALID
6095                                                                ; STORE BITS TO BE WRITTEN TO
6096                                                                ;CMR<12> ONLY DURING THE  DESTINATION
6097                                                                ;ACCESS OF AN INSTRUCTION. STORE
6098 036322  012737  000015  177746        MOV     #15,CCR         ;NO UCB SO AS TO UPDATE VALID STORE
6099 036330  005721                6$:     TST     (R1)+           ;
6100 036332  005720                        TST     (R0)+           ;UPDATE ALL HI CACHE VALID STORE
6101                                                                ;ADDRESS LOCATIONS SPECIFIED BY R0
6102 036334  022700  100000                CMP     #100000,R0      ;DONE?
6103 036340  001373                        BNE     6$              ;NO
6104 036342  012700  070000                MOV     #70000,R0       ;ADDR. 70000 TO R0
6105 036346  052737  001000  177746        BIS     #UCB,CCR        ;ENABLE UCB
6106 036354  010220                13$:    MOV     R2,(R0)+        ;WRITE HIT WITH UCB WILL INVALIDATE
6107                                                                ;OR WRITE 0 TO ALL HI CACHE VALID STORE
6108 036356  022700  100000                CMP     #100000,R0      ;DONE?
6109 036362  001374                        BNE     13$             ;NO
6110 036364  042737  001000  177746        BIC     #UCB,CCR        ;DISABLE UCB SO AS TO ALLOW VALID STORE UPDATES
6111 036372  012700  070000                MOV     #70000,R0       ;ADDRESS 70000 TO R0
6112 036376  005710                7$:     TST     (R0)            ;READ MISS TO CACHE LOCATION SPECIFIED
```

TEST # 201 - VERIFY CACHE VALID STORE RAM MEMORY IC'S

```
                                                                        ;BY R0.  CLOCK VALID STORE
                                                                        ;BIT INTO CMR<12>.SHOULD BE 0.
                                                                        ;ALSO CAUSES UPDATE TO CACHE.
                                                                        ;VALID STORE LOCATION WILL BE WRITTEN WITH A 1.
6117 036400  013705  177750            MOV     CMR,R5                  ;SAVE CMR CONTENTS
6118 036404  005710                    TST     (R0)                    ;READ HIT.CLOCK VALID STORE BIT TO CMR<12>
                                                                        ;SHOULD BE 1.
6120 036406  013703  177750            MOV     CMR,R3                  ;SAVE CMR CONTENTS
6121 036412  000240              25$:  NOP                             ;INSTRUCTION 'JMP 1$' PLACED HERE
     036414  000240                    NOP                             ;FOR  LOOP ON ERROR
6122 036416  042705  167777            BIC     #167777,R5              ;INTERESTED IN BIT 12
6123 036422  005705                    TST     R5                      ;BIT 12 SHOULD BE 0
6124 036424  001416                    BEQ     8$                      ;PASS
6125 036426  012737  001015  177746    MOV     #OFF,CCR                ;DISABLE CACHE
6126 036434  105037  177750            CLRB    CMR                     ;CLEAR MAINT. MODE
6127 036440  010037  047334            MOV     R0,CA121                ;SPECIFY FAILED VALID STORE ADDRESS LOCATION
6128 036444  006237  047334            ASR     CA121
6129 036450  104406                    ERROR                           ;ERROR
                                                                        ;-----
     036452  036450                    .WORD   .-2
6130                                                                    ;VALID STORE MARCH PATTERN TEST- SET A
6131                                                                    ;READING CACHE VALID STORE DATA
6132                                                                    ;THRU CMR<12> DID NOT READ  0.
6133                                                                    ;THIS SUGGESTS THAT A RAM LOCATION
6134                                                                    ;SPECIFIED BY CA121 WAS OVERWRITTEN
6135                                                                    ;WITH A 1 WHEN WRITING A 1 TO ANOTHER
6136                                                                    ;LOCATION.
6137                                                                    ;THIS INDICATES THAT VALID STORE RAM SET A IS BAD.
6138 036454  047334            CA121                                   ;SPECIFY FAILED VALID STORE ADDRESS LOCATION
6139 036456  000000            .WORD   0
6140 036460  000430            BR      3$                              ;END THE TEST
6141 036462  042703  167777      8$:   BIC     #167777,R3              ;INTERESTED IN BIT 12 ONLY
6142 036466  022703  010000            CMP     #10000,R3               ;BIT 12 SHOULD BE 1
6143 036472  001416                    BEQ     9$                      ;PASS
6144 036474  012737  001015  177746    MOV     #OFF,CCR                ;DISABLE CACHE
6145 036502  105037  177750            CLRB    CMR                     ;CLEAR MAINT. MODE
6146 036506  010037  047334            MOV     R0,CA121                ;SPECIFY FAILED VALID STORE ADDRESS LOCATION
6147 036512  006237  047334            ASR     CA121
6148 036516  104406                    ERROR                           ;ERROR
                                                                        ;-----
     036520  036516                    .WORD   .-2
6149                                                                    ;VALID STORE MARCH PATTERN TEST- SET A
6150                                                                    ;READING CACHE VALID STORE DATA
6151                                                                    ;THRU CMR<12> DID NOT READ  1.
6152                                                                    ;THIS SUGGESTS THAT VALID STORE RAM
6153                                                                    ;IC SET A IS BAD.
6154                                                                    ;THRU CMR<12>
6155 036522  047334            CA121                                   ;SPECIFY FAILED VALID STORE ADDRESS LOCATION
6156 036524  000000            .WORD   0
6157 036526  000405            BR      3$                              ;END TEST
6158 036530  062700  000002      9$:   ADD     #2,R0                   ;NEXT LOCATION
6159 036534  022700  100000            CMP     #100000,R0              ;HAS ALL HI CACHE BEEN DONE?
6160 036540  001316                    BNE     7$                      ;NO,CONTINUE
6161 036542  012737  001015  177746  3$:   MOV     #OFF,CCR                ;DISABLE CACHE
6162 036550  105037  177750            CLRB    CMR                     ;DISABLE MAINT. MODE
6163 036554  000240              10$:  NOP                             ;END OF TEST
     036556  005237  001472            INC     $TESTN                  ;INCREMENT TEST COUNTER
```

```
6178                                    .SBTTL  TEST # 202 - VERIFY CACHE VALID STORE RAM MEMORY IC'S
                                        ;;*****************************************************************
                                        ;*TEST 202 - VERIFY CACHE VALID STORE RAM MEMORY IC'S
                                        ;*      VERIFY CACHE VALID STORE RAM MEMORY IC'S BY PERFORMING A
                                        ;*      MARCH PATTERN TEST TO LOW CACHE AREA OF VALID STORE(LOC. 0000-3777)
                                        ;*      PROCEDURE:  1. WRITE 0'S  TO LO CACHE VALID STORE
                                        ;*                     RAM CORRESPONDING TO LOCATIONS 0000-3777
                                        ;*                  2. READ 0 FROM  LO CACHE RAM CORRESPONDING
                                        ;*                     TO LOCATION 0000
                                        ;*                  3. WRITE  1 TO  RAM CORRESPONDING TO LOCATION
                                        ;*                     0000.
                                        ;*                  4. READ 1 FROM  RAM CORRESPONDING TO LOCATION
                                        ;*                     0000.
                                        ;*                  5. REPEAT SREPS 2 THRU 4 WITH NEXT LOCATION
                                        ;*                     AND UNTIL LOC. 3777 IS REACHED.
                                        ;;*****************************************************************
    036562
6179 036562  000004                    TST202:
                                            SCPCND                      ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
    036564  036574                          .WORD   40$                 ;TEST START LOCATION
    036566  070026                          .WORD   1$-40$+67764        ;LOOP ON ERROR START LOCATION
    036570  000000                          .WORD   0                   ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
    036572  070136                          .WORD   25$-40$+67764       ;LOOP ON ERROR END LOCATION
    036574  012737  001015  177746  40$:    MOV     #OFF,CCR            ;DISABLE CACHE
    036602  004437  002370                  JSR     R4,RELCTH           ;LOCATE TEST CODE TO HIGH CACHE SPACE
    036606  037112                          .WORD   10$+2               ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

6180 036610  032737  020000  177746          BIT     #VSIU,CCR           ;IS SET B USED
6181 036616  001007                          BNE     1$                  ;YES
6182 036620  052737  000400  177746          BIS     #FC,CCR             ;FLUSH
6183 036626  032737  010000  177746  200$:   BIT     #VCIP,CCR
6184 036634  001374                          BNE     200$
6185 036636  012700  060000          1$:     MOV     #60000,R0           ;1ST ADDRESS LOCATION IN R0
6186 036642  012701  040000                  MOV     #40000,R1           ;ADDRESS 40000 IN R1
6187 036646  005002                          CLR     R2
6188 036650  112737  000002  177750          MOVB    #HODO,CMR           ;HODO ALLOWS CACHE UPDATES &  VALID
6189                                                                    ; STORE BITS TO BE WRITTEN TO
6190                                                                    ;CMR<12> ONLY DURING THE  DESTINATION
6191                                                                    ;ACCESS OF AN INSTRUCTION.  STORE
6192 036656  012737  000015  177746          MOV     #15,CCR             ;NO UCB SO AS TO UPDATE VALID STORE
6193 036664  005721                  6$:     TST     (R1)+               ;
6194 036666  005720                          TST     (R0)+               ;UPDATE ALL LO CACHE VALID STORE
6195                                                                    ;ADDRESS LOCATIONS SPECIFIED BY R0
6196 036670  022700  070000                  CMP     #70000,R0           ;DONE?
6197 036674  001373                          BNE     6$                  ;NO
6198 036676  012700  060000                  MOV     #60000,R0           ;ADDR. 60000 TO R0
6199 036702  052737  001000  177746          BIS     #UCB,CCR            ;ENABLE UCB
6200 036710  010220                  13$:    MOV     R2,(R0)+            ;WRITE HIT WITH UCB WILL INVALIDATE
6201                                                                    ;OR WRITE 0 TO ALL LO CACHE VALID STORE
6202 036712  022700  070000                  CMP     #70000,R0           ;DONE?
6203 036716  001374                          BNE     13$                 ;NO
6204 036720  042737  001000  177746          BIC     #UCB,CCR            ;DISABLE UCB SO AS TO ALLOW VALID STORE UPDATES
6205 036726  012700  060000                  MOV     #60000,R0           ;ADDRESS 60000 TO R0
6206 036732  005710                  7$:     TST     (R0)                ;READ MISS TO CACHE LOCATION SPECIFIED
```

```
                                                                        ;BY R0.  CLOCK VALID STORE
                                                                        ;BIT INTO CMR<12>.SHOULD BE 0.
                                                                        ;ALSO CAUSES UPDATE TO CACHE.
                                                                        ;VALID STORE LOCATION WILL BE WRITTEN WITH A 1.
6211 036734  013705  177750            MOV     CMR,R5                  ;SAVE CMR CONTENTS
6212 036740  005710                    TST     (R0)                    ;READ HIT.CLOCK VALID STORE BIT TO CMR<12>
6213                                                                    ;SHOULD BE 1.
6214 036742  013703  177750            MOV     CMR,R3                  ;SAVE CMR CONTENTS
6215 036746  000240              25$:  NOP                             ;INSTRUCTION 'JMP 1$' PLACED HERE
     036750  000240                    NOP                             ;FOR  LOOP ON ERROR
6216 036752  042705  167777            BIC     #167777,R5              ;INTERESTED IN BIT 12
6217 036756  005705                    TST     R5                      ;BIT 12 SHOULD BE 0
6218 036760  001416                    BEQ     8$                      ;PASS
6219 036762  012737  001015  177746    MOV     #OFF,CCR                ;DISABLE CACHE
6220 036770  105037  177750            CLRB    CMR                     ;CLEAR MAINT. MODE
6221 036774  010037  047334            MOV     R0,CA121                ;SPECIFY FAILED VALID STORE ADDRESS LOCATION
6222 037000  006237  047334            ASR     CA121
6223 037004  104406                    ERROR                           ;ERROR
                                                                        ;-----
     037006  037004                    .WORD   .-2
6224                                                                    ;VALID STORE MARCH PATTERN TEST- SET B
6225                                                                    ;READING CACHE VALID STORE DATA
6226                                                                    ;THRU CMR<12> DID NOT READ  0.
6227                                                                    ;THIS SUGGESTS THAT A RAM LOCATION
6228                                                                    ;SPECIFIED BY CA121 WAS OVERWRITTEN
6229                                                                    ;WITH A 1 WHEN WRITING A 1 TO ANOTHER
6230                                                                    ;LOCATION.
6231                                                                    ;THIS INDICATES THAT VALID STORE RAM
6232                                                                    ;SET B IS BAD.
6233
6234 037010  047334                    CA121                           ;SPECIFY FAILED VALID STORE ADDRESS LOCATION
6235 037012  000000                    .WORD   0
6236 037014  000430                    BR      3$                      ;END THE TEST
6237 037016  042703  167777      8$:   BIC     #167777,R3              ;INTERESTED IN BIT 12 ONLY
6238 037022  022703  010000            CMP     #10000,R3               ;BIT 12 SHOULD BE 1
6239 037026  001416                    BEQ     9$                      ;PASS
6240 037030  012737  001015  177746    MOV     #OFF,CCR                ;DISABLE CACHE
6241 037036  105037  177750            CLRB    CMR                     ;CLEAR MAINT. MODE
6242 037042  010037  047334            MOV     R0,CA121                ;SPECIFY FAILED VALID STORE ADDRESS LOCATION
6243 037046  006237  047334            ASR     CA121
6244 037052  104406                    ERROR                           ;ERROR
                                                                        ;-----
     037054  037052                    .WORD   .-2
6245                                                                    ;VALID STORE MARCH PATTERN TEST- SET B
6246                                                                    ;READING CACHE VALID STORE DATA
6247                                                                    ;THRU CMR<12> DID NOT READ  1.
6248                                                                    ;THIS SUGGESTS THAT VALID STORE RAM
6249                                                                    ;IC SET B IS BAD.
6250
6251                                                                    ;THRU CMR<12>
6252 037056  047334                    CA121                           ;SPECIFY FAILED VALID STORE ADDRESS LOCATION
6253 037060  000000                    .WORD   0
6254 037062  000405                    BR      3$                      ;END TEST
6255 037064  062700  000002      9$:   ADD     #2,R0                   ;NEXT LOCATION
6256 037070  022700  070000            CMP     #70000,R0               ;HAS ALL LO CACHE BEEN DONE?
6257 037074  001316                    BNE     7$                      ;NO,CONTINUE
6258 037076  012737  001015  177746  3$:   MOV     #OFF,CCR            ;DISABLE CACHE
```

```
 6259 037104  105037  177750                CLRB    CMR             ;DISABLE MAINT. MODE
 6260 037110  000240                 10$:    NOP                     ;END OF TEST
      037112  005237  001472                INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
   6275                                 .SBTTL  TEST # 203 - VERIFY CACHE VALID STORE RAM MEMORY IC'S
                                        ;;*****************************************************************
                                        ;*TEST 203 - VERIFY CACHE VALID STORE RAM MEMORY IC'S
                                        ;*      VERIFY CACHE VALID STORE RAM MEMORY IC'S BY PERFORMING A
                                        ;*      MARCH PATTERN TEST TO HIGH CACHE AREA OF VALID STORE(LOC. 4000-7777)
                                        ;*      PROCEDURE:  1. WRITE 0'S  TO HI CACHE VALID STORE
                                        ;*                     RAM CORRESPONDING TO LOCATIONS 4000-7777
                                        ;*                  2. READ 0 FROM  HI CACHE RAM CORRESPONDING
                                        ;*                     TO LOCATION 4000
                                        ;*                  3. WRITE  1 TO  RAM CORRESPONDING TO LOCATION
                                        ;*                     4000
                                        ;*                  4. READ 1 FROM  RAM CORRESPONDING TO LOCATION
                                        ;*                     4000
                                        ;*                  5. REPEAT SREPS 2 THRU 4 WITH NEXT LOCATION
                                        ;*                     AND UNTIL LOC. 77   IS REACHED.
                                        ;;*****************************************************************
                                        TST203:
        037116
   6276 037116  000004                          SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
        037120  037130                          .WORD   40$             ;TEST START LOCATION
        037122  060026                          .WORD   1$-40$+57764    ;LOOP ON ERROR START LOCATION
        037124  000000                          .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
        037126  060136                          .WORD   25$-40$+57764   ;LOOP ON ERROR END LOCATION
        037130  012737  001015  177746  40$:    MOV     #OFF,CCR        ;DISABLE CACHE
        037136  004437  002342                  JSR     R4,RELCTL       ;LOCATE TEST CODE TO LOW CACHE SPACE
        037142  037446                          .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO LOW CACHE SPACE

   6277 037144  032737  020000  177746          BIT     #VSIU,CCR       ;IS SET B USED
   6278 037152  001007                          BNE     1$              ;YES
   6279 037154  052737  000400  177746          BIS     #FC,CCR         ;FLUSH
   6280 037162  032737  010000  177746  200$:   BIT     #VCIP,CCR
   6281 037170  001374                          BNE     200$
   6282 037172  012700  070000          1$:     MOV     #70000,R0       ;1ST ADDRESS LOCATION IN R0
   6283 037176  012701  050000                  MOV     #50000,R1       ;ADDRESS 50000 IN R1
   6284 037202  005002                          CLR     R2
   6285 037204  112737  000002  177750          MOVB    #HODO,CMR       ;HCDO ALLOWS CACHE UPDATES &  VALID
   6286                                                                 ; STORE BITS TO BE WRITTEN TO
   6287                                                                 ;CMR<12> ONLY DURING THE  DESTINATION
   6288                                                                 ;ACCESS OF AN INSTRUCTION.
   6289                                                                 ;STORE
   6290 037212  012737  000015  177746          MOV     #15,CCR         ;NO UCB SO AS TO UPDATE VALID STORE
   6291 037220  005721                  6$:     TST     (R1)+           ;
   6292 037222  005720                          TST     (R0)+           ;UPDATE ALL HI CACHE VALID STORE
   6293                                                                 ;ADDRESS LOCATIONS SPFCIFIED BY R0
   6294 037224  022700  100000                  CMP     #100000,R0      ;DONE?
   6295 037230  001373                          BNE     6$              ;NO
   6296 037232  012700  070000                  MOV     #70000,R0       ;ADDR. 70000 TO R0
   6297 037236  052737  001000  177746          BIS     #UCB,CCR        ;ENABLE UCB
   6298 037244  010220                  13$:    MOV     R2,(R0)+        ;WRITE HIT WITH UCB WILL INVALIDATE
   6299                                                                 ;OR WRITE 0 TO ALL HI CACHE VALID STORE
   6300 037246  022700  100000                  CMP     #100000,R0      ;DONE?
   6301 037252  001374                          BNE     13$             ;NO
   6302 037254  042737  001000  177746          BIC     #UCB,CCR        ;DISABLE UCB SO AS TO ALLOW VALID STORE UPDATES
   6303 037262  012700  070000                  MOV     #70000,R0       ;ADDRESS 70000 TO R0
```

```
6304 037266  005710                7$:     TST     (R0)            ;READ MISS TO CACHE LOCATION SPECIFIED
6305                                                                ;BY R0.  CLOCK VALID STORE
6306                                                                ;BIT INTO CMR<12>.SHOULD BE 0.
6307                                                                ;ALSO CAUSES UPDATE TO CACHE.
6308                                                                ;VALID STORE LOCATION WILL BE WRITTEN
6309                                                                ;WITH A 1.
6310 037270  013705  177750                MOV     CMR,R5          ;SAVE CMR CONTENTS
6311 037274  005710                        TST     (R0)            ;READ HIT.CLOCK VALID STORE BIT TO CMR<12>
6312                                                                ;SHOULD BE 1.
6313 037276  013703  177750                MOV     CMR,R3          ;SAVE CMR CONTENTS
6314 037302  000240                25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     037304  000240                        NOP                     ;FOR  LOOP ON ERROR
6315 037306  042705  167777                BIC     #167777,R5      ;INTERESTED IN BIT 12
6316 037312  005705                        TST     R5              ;BIT 12 SHOULD BE 0
6317 037314  001416                        BEQ     8$              ;PASS
6318 037316  012737  001015  177746        MOV     #OFF,CCR        ;DISABLE CACHE
6319 037324  105037  177750                CLRB    CMR             ;CLEAR MAINT. MODE
6320 037330  010037  047334                MOV     R0,CA121        ;SPECIFY FAILED VALID STORE ADDRESS LOCATION
6321 037334  006237  047334                ASR     CA121
6322 037340  104406                        ERROR                   ;ERROR
                                                                    ;-----
     037342  037340                        .WORD   .-2
6323                                                                ;VALID STORE MARCH PATTERN TEST- SET B
6324                                                                ;READING CACHE VALID STORE DATA
6325                                                                ;THRU CMR<12> DID NOT READ  0.
6326                                                                ;THIS SUGGESTS THAT A RAM LOCATION
6327                                                                ;SPECIFIED BY CA121 WAS OVERWRITTEN
6328                                                                ;WITH A 1 WHEN WRITING A 1 TO ANOTHER
6329                                                                ;LOCATION.
6330                                                                ;THIS INDICATES THAT VALID STORE RAM
6331                                                                ;SET B IS BAD.
6332
6333 037344  047334                        CA121                   ;SPECIFY FAILED VALID STORE ADDRESS LOCATION
6334 037346  000000                        .WORD   0
6335 037350  000430                        BR      3$              ;END THE TEST
6336 037352  042703  167777        8$:     BIC     #167777,R3      ;INTERESTED IN BIT 12 ONLY
6337 037356  022703  010000                CMP     #10000,R3       ;BIT 12 SHOULD BE 1
6338 037362  001416                        BEQ     9$              ;PASS
6339 037364  012737  001015  177746        MOV     #OFF,CCR        ;DISABLE CACHE
6340 037372  105037  177750                CLRB    CMR             ;CLEAR MAINT. MODE
6341 037376  010037  047334                MOV     R0,CA121        ;SPECIFY FAILED VALID STORE ADDRESS LOCATION
6342 037402  006237  047334                ASR     CA121
6343 037406  104406                        ERROR                   ;ERROR
                                                                    ;-----
     037410  037406                        .WORD   .-2
6344                                                                ;VALID STORE MARCH PATTERN TEST- SET B
6345                                                                ;READING CACHE VALID STORE DATA
6346                                                                ;THRU CMR<12> DID NOT READ  1.
6347                                                                ;THIS SUGGESTS THAT VALID STORE RAM
6348                                                                ;IC SET B IS BAD.
6349                                                                ;THRU CMR<12>
6350 037412  047334                        CA121                   ;SPECIFY FAILED VALID STORE ADDRESS LOCATION
6351 037414  000000                        .WORD   0
6352 037416  000405                        BR      3$              ;END TEST
6353 037420  062700  000002        9$:     ADD     #2,R0           ;NEXT LOCATION
```

```
 6354 037424  022700  100000                    CMP     #100000,R0      ;HAS ALL HI CACHE BEEN DONE?
 6355 037430  001316                            BNE     7$              ;NO,CONTINUE
 6356 037432  012737  001015  177746  3$:       MOV     #OFF,CCR        ;DISABLE CACHE
 6357 037440  105037  177750                    CLRB    CMR             ;DISABLE MAINT. MODE
 6358 037444  000240                    10$:    NOP                     ;END OF TEST
      037446  005237  001472                    INC     $TESTN          ;INCREMENT TEST COUNTER
```

TEST # 204 - VERIFY CACHE VALID STORE RAM MEMORY IC'S

```
6379                                    .SBTTL  TEST # 204 - VERIFY CACHE VALID STORE RAM MEMORY IC'S
                                        ;;*****************************************************************
                                        ;*TEST 204 - VERIFY CACHE VALID STORE RAM MEMORY IC'S
                                        ;*      VERIFY THAT THE CACHE HIT NAND GATE CAN INDICATE A READ
                                        ;*              HIT CONDITION.
                                        ;*      PROCEDURE:      CREATE A READ HIT CONDITION TO LO CACHE
                                        ;*                      WITH LO CACHE ENABLED,AND VERIFY THAT
                                        ;*                      OUTPUT OF THE CACHE HIT NAND GATE  READS 0
                                        ;*                      THRU CMR<8>.
                                        ;*      CONDITIONS:     INPUTS CACHE HIT NAND GATE:
                                        ;*                        COMPARE 1     =1
                                        ;*                        COMPARE 2     =1
                                        ;*                        COMPARE 3     =1
                                        ;*                        VALID         =1
                                        ;*                        TAG PAR. ERR  =1
                                        ;*                        HI BYTE PE    =1
                                        ;*                        LO BYTE PE    =1
                                        ;*                        MISS HI       =1
                                        ;*                        MISS LO       =1
                                        ;*                        BYPASS/WRITE  =1
                                        ;*                        FAULT         =1
                                        ;;*****************************************************************
                                        TST204:
     037452
6380 037452  000004                            SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                       ;ERROR/LOOP ON TEST
     037454  037464                            .WORD   40$             ;TEST START LOCATION
     037456  070004                            .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     037460  070030                            .WORD   20$-40$+67764   ;SCOPE SYNC. LOCATION
     037462  070040                            .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     037464  012737  001015  177746  40$:      MOV     #OFF,CCR        ;DISABLE CACHE
     037472  004437  002370                    JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     037476  037570                            .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

6381 037500  005037  060000                    CLR     60000           ;ALL 0'S TO MAIN MEMORY LOC. 60000
6382 037504  112737  000002  177750  1$:       MOVB    #HODO,CMR       ;HODO ALLOWS READ HITS TO BE CACHED,CACHE UPDATES,AND
6383                                                                   ;CLOCKING OF OUTPUT OF CACHE HIT NAND
6384                                                                   ;GATE INTO CMR ONLY DURING THE DESTINATION
6385                                                                   ;ACCESS OF AN INSTRUCTION.
6386 037512  012737  000011  177746            MOV     #11,CCR         ;NO UCB SO AS TO WRITE CACHE STORES
6387                                                                   ;ENABLE LOW CACHE FOR A READ HIT
6388 037520  005737  040000                    TST     40000           ;
6389 037524  005737  060000                    TST     60000           ;READ UPDATE TO LOW CACHE LOACATION 0000
6390 037530  005737  060000            20$:    TST     60000           ;READ HIT; ALL INPUTS OF CACHE HIT NAND
6391                                                                   ;GATE ARE 1; CLOCK STATUS OF NAND GATE
6392                                                                   ;OUTPUT TO CMR<8>
6393 037534  013701  177750                    MOV     CMR,R1          ;SAVE CMR CONTENTS
6394 037540  000240            25$:    NOP                             ;INSTRUCTION 'JMP 1$' PLACED HERE
     037542  000240                    NOP                             ;FOR  LOOP ON ERROR
6395 037544  012737  001015  177746            MOV     #OFF,CCR        ;DISABLE CACHE
6396 037552  032701  000400                    BIT     #HIT,R1         ;WAS CACHE HIT SIGNAL A 0
6397 037556  001403                            BEQ     10$             ;PASS
6398 037560  104406                            ERROR                   ;ERROR
                                                                       ;-----
     037562  037560                            .WORD   .-2
```

TEST # 204 - VERIFY CACHE VALID STORE RAM MEMORY IC'S

```
   6399                                                          ;CACHE HIT TESTS
   6400                                                          ;READING OUTPUT OF CACHE HIT NAND GATE
   6401                                                          ;THRU CMR<8> DID NOT RESULT IN A 0
   6402 037564  000000                    .WORD   0
   6403 037566  000240            10$:    NOP                    ;END OF TEST
        037570  005237  001472            INC     $TESTN         ;INCREMENT TEST COUNTER
```

```
6423                                    .SBTTL  TEST # 205 - CHECK FORCE MISS LOGIC.
                                        ;;*****************************************************************
                                        ;*TEST 205 - CHECK FORCE MISS LOGIC.
                                        ;*      CHECK FORCE MISS LOGIC.
                                        ;*      PROCEDURE:      CREATE A READ HIT CONDITION TO HIGH CACHE
                                        ;*                      WITH 'FORCE MISS HI' DISABLED AND 'FORCE MISS
                                        ;*                      LO' ENABLED. VERIFY OUTPUT OF CACHE HIT NAND
                                        ;*                      GATE READS A 0 THRU CMR<8>.
                                        ;*              CONDITIONS:     INPUTS CACHE HIT NAND GATE:
                                        ;*                      COMPARE 1       =1
                                        ;*                      COMPARE 2       =1
                                        ;*                      COMPARE 3       =1
                                        ;*                      VALID           =1
                                        ;*                      TAG PAR. ERR    =1
                                        ;*                      HI BYTE PE      =1
                                        ;*                      LO BYTE PE      =1
                                        ;*                      MISS HI         =1
                                        ;*                      MISS LO         =1
                                        ;*                      BYPASS/WRITE    =1
                                        ;*                      FAULT           =1
                                        ;;*****************************************************************
     037574
6424 037574  000004                    TST205:
                                                SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     037576  037606                             .WORD   40$             ;TEST START LOCATION
     037600  060004                             .WORD   1$-40$+57764    ;LOOP ON ERROR START LOCATION
     037602  060030                             .WORD   20$-40$+57764   ;SCOPE SYNC LOCATION
     037604  060040                             .WORD   25$-40$+57764   ;LOOP ON ERROR END LOCATION
     037606  012737  001015  177746   40$:      MOV     #OFF,CCR        ;DISABLE CACHE
     037614  004437  002342                     JSR     R4,RELCTL       ;LOCATE TEST CODE TO LOW CACHE SPACE
     037620  037712                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO LOW CACHE SPACE

6425 037622  005037  070000                    CLR     70000           ;ALL 0'S TO MAIN MEMORY LOC. 70000
6426 037626  112737  000002  177750   1$:      MOVB    #HODO,CMR       ;HODO ALLOWS READ HITS TO BE CACHED,CACHE UPDATES,AND
6427                                                                    ;CLOCKING OF OUTPUT OF CACHE HIT NAND
6428                                                                    ;GATE INTO CMR ONLY DURING THE DESTINATION
6429                                                                    ;ACCESS OF AN INSTRUCTION.
6430 037634  012737  000005  177746            MOV     #5,CCR          ;NO UCB SO AS TO WRITE CACHE STORES
6431                                                                    ;ENABLE HI CACHE FOR A READ HIT
6432                                                                    ;DISABLE LO CACHE
6433 037642  005737  050000                    TST     50000           ;
6434 037646  005737  070000                    TST     70000           ;READ UPDATE TO HI CACHE LOACATION 4000
6435 037652  005737  070000            20$:    TST     70000           ;READ HIT; ALL INPUTS OF CACHE HIT NAND
6436                                                                    ;GATE ARE 1; CLOCK STATUS OF NAND GATE
6437                                                                    ;OUTPUT TO CMR<8>
6438 037656  013701  177750                    MOV     CMR,R1          ;SAVE CMR CONTENTS
6439 037662  000240            25$:    NOP                             ;INSTRUCTION 'JMP 1$' PLACED HERE
     037664  000240                    NOP                             ;FOR  LOOP ON ERROR
6440 037666  012737  001015  177746            MOV     #OFF,CCR        ;DISABLE CACHE
6441 037674  032701  000400                    BIT     #HIT,R1         ;WAS CACHE HIT SIGNAL A 0
6442 037700  001403                    BEQ     10$                     ;PASS
```

TEST # 205 - CHECK FORCE MISS LOGIC.

```
 6443 037702  104406                        ERROR                   ;ERROR
                                                                      ;-----
      037704  037702                        .WORD   .-2
 6444                                                                 ;CACHE HIT TESTS
 6445                                                                 ;READING OUTPUT OF CACHE HIT NAND GATE
 6446                                                                 ;THRU CMR<8> DID NOT RESULT IN A 0
 6447 037706  000000                        .WORD   0
 6448 037710  000240                 10$:   NOP                     ;END OF TEST
      037712  005237  001472                INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
   6468                                 .SBTTL  TEST # 206 - CHK 'FORCE MISS LO' INHIBITS CACHE NAND GATE
                                        ;;*****************************************************************
                                        ;*TEST 206 - CHK 'FORCE MISS LO' INHIBITS CACHE NAND GATE
                                        ;*      VERIFY THAT 'FORCE MISS LO' WILL INHIBIT CACHE HIT NAND GATE
                                        ;*      FROM INDICATING A CACHE HIT.
                                        ;*      PROCEDURE:      WITH 'FORCE MISS LO' ENABLED ATTEMPT A READ HIT TO LOW CACHE.
                                        ;*                      VERIFY THAT THE OUTPUT OF CACHE HIT NAND GATE
                                        ;*                      WILL READ AS A 1 THRU CMR<8>.
                                        ;*      CONDITIONS:     INPUTS CACHE HIT NAND GATE:
                                        ;*                        COMPARE 1     =1
                                        ;*                        COMPARE 2     =1
                                        ;*                        COMPARE 3     =1
                                        ;*                        VALID         =1
                                        ;*                        TAG PAR. ERR  =1
                                        ;*                        HI BYTE PE    =1
                                        ;*                        LO BYTE PE    =1
                                        ;*                        MISS HI       =1
                                        ;*                        MISS LO       =0
                                        ;*                        BYPASS/WRITE  =1
                                        ;*                        FAULT         =1
                                        ;;*****************************************************************
        037716                          TST206:
   6469 037716  000004                          SCPCND                          ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                                ;ERROR/LOOP ON TEST
        037720  037730                          .WORD   40$                     ;TEST START LOCATION
        037722  070004                          .WORD   1$-40$+67764            ;LOOP ON ERROR START LOCATION
        037724  070030                          .WORD   20$-40$+67764           ;SCOPE SYNC. LOCATION
        037726  070040                          .WORD   25$-40$+67764           ;LOOP ON ERROR END LOCATION
        037730  012737  001015  177746  40$:    MOV     #OFF,CCR                ;DISABLE CACHE
        037736  004437  002370                  JSR     R4,RELCTH               ;LOCATE TEST CODE TO HIGH CACHE SPACE
        037742  040034                          .WORD   10$+2                   ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

   6470 037744  005037  060000                  CLR     60000                   ;ALL 0'S TO MAIN MEMORY LOC. 60000
   6471 037750  112737  000002  177750  1$:     MOVB    #HODO,CMR               ;HODO ALLOWS READ HITS TO BE CACHED,CACHE UPDATES,AND
   6472                                                                         ;CLOCKING OF OUTPUT OF CACHE HIT NAND
   6473                                                                         ;GATE INTO CMR ONLY DURING THE DESTINATION
   6474                                                                         ;ACCESS OF AN INSTRUCTION.
   6475 037756  012737  000015  177746          MOV     #15,CCR                 ;NO UCB SO AS TO WRITE CACHE STORES
   6476                                                                         ;DISABLE LOW CACHE
   6477 037764  005737  040000                  TST     40000                   ;
   6478 037770  005737  060000                  TST     60000                   ;READ UPDATE TO LOW CACHE LOACATION 0000
   6479 037774  005737  060000          20$:    TST     60000                   ;READ HIT;
   6480                                                                         ; CLOCK STATUS OF NAND GATE
   6481                                                                         ;OUTPUT TO CMR<8>
   6482 040000  013701  177750                  MOV     CMR,R1                  ;SAVE CMR CONTENTS
   6483 040004  000240                  25$:    NOP                             ;INSTRUCTION 'JMP 1$' PLACED HERE
        040006  000240                          NOP                             ;FOR  LOOP ON ERROR
   6484 040010  012737  001015  177746          MOV     #OFF,CCR                ;DISABLE CACHE
   6485 040016  032701  000400                  BIT     #HIT,R1                 ;WAS CACHE HIT SIGNAL A 1
   6486 040022  001003                          BNE     10$                     ;PASS
   6487 040024  104406                          ERROR                           ;ERROR
                                                                                ;-----
        040026  040024                          .WORD   .-2
   6488                                                                         ;CACHE HIT TESTS
```

TEST # 206 - CHK 'FORCE MISS LO' INHIBITS CACHE NAND GATE

```
6489                                                    ;READING OUTPUT OF CACHE HIT NAND GATE
6490                                                    ;THRU CMR<8> DID NOT RESULT IN A 1
6491 040030  000000                    .WORD   0
6492 040032  000240            10$:    NOP                     ;END OF TEST
     040034  005237  001472            INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 207 - CHK 'TAG PARITY ERROR' INHIBITS CACHE NAND GATE
                                ;;*****************************************************************
                                ;*TEST 207 - CHK 'TAG PARITY ERROR' INHIBITS CACHE NAND GATE
                                ;*      VERIFY THAT 'TAG PARITY ERROR' WILL INHIBIT CACHE HIT NAND GATE
                                ;*      FROM INDICATING A CACHE HIT.
                                ;*      CONDITIONS:     INPUTS CACHE HIT NAND GATE:
                                ;*                        COMPARE 1     =1
                                ;*                        COMPARE 2     =1
                                ;*                        COMPARE 3     =1
                                ;*                        VALID         =1
                                ;*                        TAG PAR. ERR  =0
                                ;*                        HI BYTE PE    =1
                                ;*                        LO BYTE PE    =1
                                ;*                        MISS HI       =1
                                ;*                        MISS LO       =1
                                ;*                        BYPASS/WRITE  =1
                                ;*                        FAULT         =1
                                ;;*****************************************************************
                                TST207:
     040040
6510 040040  000004                        SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                   ;ERROR/LOOP ON TEST
     040042  040052                        .WORD   40$             ;TEST START LOCATION
     040044  070000                        .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     040046  070054                        .WORD   20$-40$+67764   ;SCOPE SYNC. LOCATION
     040050  070072                        .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     040052  012737  001015  177746  40$:   MOV     #OFF,CCR        ;DISABLE CACHE
     040060  004437  002370                JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     040064  040220                        .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO HI CACHE SPACE

6511 040066  005037  000000          1$:   CLR     0               ;0'S TO MAIN MEMORY LOCATION 0.
6512 040072  112737  000002  177750        MOVB    #HODO,CMR       ;HODO ALLOWS UPDATES AND CACHE HITS
6513                                                               ; ONLY DURING THE DESTINATION ACCESS OF
6514                                                               ;AN INSTRUCTION.
6515 040100  012737  000015  177746        MOV     #15,CCR         ;NO UCB SO AS TO WRITE CACHE STORES
6516 040106  005737  000000                TST     0               ;
6517 040112  005737  040000                TST     40000           ;UPDATE CACHE LOCATION 0000 WITH CORRECT PARITY STORAGE
6518 040116  052737  002000  177746        BIS     #WWPT,CCR       ;ALLOW WRITE WRONG PARITY TO TAGG PARITY STORE
6519 040124  005737  000000                TST     0               ;READ UPDATE TO CACHE LOCATION 0000;
6520                                                               ;ALL 0'S(EVEN DATA) WILL BE WRITTEN TO DATA/TAG STORES,
6521                                                               ;0'S INTO DATA PARITY STORES,AND A 1
6522                                                               ;INTO TAG PARITY STORE.
6523 040130  042737  002004  177746        BIC     #WWPT+FMLO,CCR  ;DISABLE WWPT;ENABLE LOW CACHE
6524 040136  005037  177744                CLR     CME             ;CLEAR CME
6525 040142  005737  000000          20$:  TST     0               ;READ HIT; ALL 0'S WILL BE PLACED ON INPUTS
6526                                                               ;OF DATA PARITY ERROR CHECK PARITY GEN'S, BUT
6527                                                               ;TAG PARITY CHECK GENERATOR WILL
6528                                                               ;SEE ODD DATA DUE TO WRONG PARITY
6529                                                               ;FROM PREVIOUS READ UPDATE.
6530                                                               ;OUTPUT TO CMR<8>
6531 040146  013701  177750                MOV     CMR,R1          ;SAVE CMR CONTENTS
6532 040152  012737  001015  177746        MOV     #OFF,CCR        ;DISABLE CACHE
6533 040160  000240                  25$:  NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     040162  000240                        NOP                     ;FOR  LOOP ON ERROR
6534 040164  052737  000400  177746        BIS     #FC,CCR         ;BEFORE LEAVING TEST ELIMINATE EFFECT OF WWPT
```

TEST # 207 - CHK 'TAG PARITY ERROR' INHIBITS CACHE NAND GATE

```
 6535 040172  032737  010000  177746  500$:   BIT     #VCIP,CCR       ;WAIT TILL DONE
 6536 040200  001374                         BNE     500$
 6537 040202  032701  000400                 BIT     #HIT,R1         ;WAS CACHE HIT SIGNAL A 1
 6538 040206  001003                         BNE     10$             ;PASS
 6539 040210  104406                         ERROR                   ;ERROR
                                                                     ;-----
      040212  040210                         .WORD   .-2
 6540                                                                ;CACHE HIT TESTS
 6541                                                                ;READING OUTPUT OF CACHE HIT NAND GATE
 6542                                                                ;THRU CMR<8> DID NOT RESULT IN A 1
 6543 040214  000000                         .WORD   0
 6544 040216  000240                 10$:    NOP                     ;END OF TEST
      040220  005237  001472                 INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 210 - CHK 'LO & HI BYTE PARITY ERROR' STOPS NAND GATE
                                ;;*****************************************************************
                                ;*TEST 210 - CHK 'LO & HI BYTE PARITY ERROR' STOPS NAND GATE
                                ;*      VERIFY THAT 'LO & HI BYTE PARITY ERROR' WILL INHIBIT CACHE HIT NAND GATE
                                ;*      FROM INDICATING A CACHE HIT.
                                ;*      CONDITIONS:     INPUTS CACHE HIT NAND GATE:
                                ;*                        COMPARE 1     =1
                                ;*                        COMPARE 2     =1
                                ;*                        COMPARE 3     =1
                                ;*                        VALID         =1
                                ;*                        TAG PAR. ERR  =1
                                ;*                        HI BYTE PE    =0
                                ;*                        LO BYTE PE    =0
                                ;*                        MISS HI       =1
                                ;*                        MISS LO       =1
                                ;*                        BYPASS/WRITE  =1
                                ;*                        FAULT         =1
                                ;;*****************************************************************
     040224
6562 040224  000004                TST210:
                                        SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                ;ERROR/LOOP ON TEST
     040226  040236                     .WORD   40$             ;TEST START LOCATION
     040230  070000                     .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     040232  070054                     .WORD   20$-40$+67764   ;SCOPE SYNC. LOCATION
     040234  070072                     .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     040236  012737  001015  177746 40$: MOV     #OFF,CCR        ;DISABLE CACHE
     040244  004437  002370             JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     040250  040404                     .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO HI CACHE SPACE

6563 040252  005037  000000       1$:  CLR     0               ;0'S TO MAIN MEMORY LOCATION 0.
6564 040256  112737  000002  177750   MOVB    #HODO,CMR       ;HODO ALLOWS UPDATES AND CACHE HITS
6565                                                            ; ONLY DURING THE DESTINATION ACCESS OF
6566                                                            ;AN INSTRUCTION.
6567 040264  012737  000015  177746   MOV     #15,CCR         ;NO UCB SO AS TO WRITE CACHE STORES
6568 040272  005737  000000           TST     0               ;
6569 040276  005737  040000           TST     40000           ;UPDATE CACHE LOCATION 0000 WITH CORRECT PARITY STORAGE
6570 040302  052737  000100  177746   BIS     #WWPD,CCR       ;ALLOW WRITE WRONG PARITY DATA TO LO
6571                                                            ;& HI BYTE PARITY STORE.
6572 040310  005737  000000           TST     0               ;READ UPDATE TO CACHE LOCATION 0000;
6573                                                            ;ALL 0'S WILL BE WRITTEN TO DATA/TAG STORES,
6574                                                            ;1'S INTO LO & HI BYTE DATA PARITY STORES,AND A 0
6575                                                            ;INTO TAG PARITY STORE.
6576 040314  042737  000104  177746   BIC     #WWPD+FMLO,CCR  ;DISABLE WWPD;ENABLE LO CACHE
6577 040322  005037  177744           CLR     CME             ;CLEAR CME
6578 040326  005737  000000      20$: TST     0               ;READ HIT; ALL 0'S(EVEN DATA) WILL BE
6579                                                            ;PLACED ON INPUTS
6580                                                            ;OF TAG PARITY ERROR CHECK PARITY GEN'S, BUT
6581                                                            ;LO & HI BYTE PARITY CHECK GENERATORS WILL
6582                                                            ;SEE ODD DATA DUE TO WRONG PARITY
6583                                                            ;FROM PREVIOUS READ UPDATE.
6584                                                            ; CLOCK STATUS OF NAND GATE TO
6585                                                            ;OUTPUT TO CMR<8>
6586 040332  013701  177750           MOV     CMR,R1          ;SAVE CMR CONTENTS
6587 040336  012737  001015  177746   MOV     #OFF,CCR        ;DISABLE CACHE
```

```
 6588 040344  000240                  25$:   NOP                    ;INSTRUCTION 'JMP 1$' PLACED HERE
      040346  000240                         NOP                    ;FOR  LOOP ON ERROR
 6589 040350  052737  000400  177746         BIS    #FC,CCR         ;BEFORE LEAVING TEST ELIMINATE EFFECTS OF WWPD
 6590 040356  032737  010000  177746  500$:  BIT    #VCIP,CCR       ;WAIT TILL DONE
 6591 040364  001374                         BNE    500$
 6592 040366  032701  000400                BIT    #HIT,R1         ;WAS CACHE HIT SIGNAL A 1
 6593 040372  001003                         BNE    10$             ;PASS
 6594 040374  104406                         ERROR                  ;ERROR
                                             ;-----
      040376  040374                         .WORD  .-2
 6595                                        ;CACHE HIT TESTS
 6596                                        ;READING OUTPUT OF CACHE HIT NAND GATE
 6597                                        ;THRU CMR<8> DID NOT RESULT IN A 1
 6598 040400  000000                         .WORD  0
 6599 040402  000240                  10$:   NOP                    ;END OF TEST
      040404  005237  001472                INC    $TESTN          ;INCREMENT TEST COUNTER
```

TEST # 211 - 'FORCE MISS HI' INHIBITS NAND FROM IND. CACHE HIT

```
                                .SBTTL  TEST # 211 - 'FORCE MISS HI' INHIBITS NAND FROM IND. CACHE HIT
                                ;;*****************************************************************
                                ;*TEST 211 - 'FORCE MISS HI' INHIBITS NAND FROM IND. CACHE HIT
                                ;*      VERIFY THAT 'FORCE MISS HI' WILL INHIBIT CACHE HIT NAND GATE
                                ;*      FROM INDICATING A CACHE HIT.
                                ;*      PROCEDURE:      WITH 'FORCE MISS HI' ENABLED ATTEMPT A READ HIT TO HI CACHE.
                                ;*                      VERIFY THAT THE OUTPUT OF CACHE HIT NAND GATE
                                ;*                      WILL READ AS A 1 THRU CMR<8>.
                                ;*      CONDITIONS:     INPUTS CACHE HIT NAND GATE:
                                ;*                        COMPARE 1     =1
                                ;*                        COMPARE 2     =1
                                ;*                        COMPARE 3     =1
                                ;*                        VALID         =1
                                ;*                        TAG PAR. ERR  =1
                                ;*                        HI BYTE PE    =1
                                ;*                        LO BYTE PE    =1
                                ;*                        MISS HI       =0
                                ;*                        MISS LO       =1
                                ;*                        BYPASS/WRITE  =1
                                ;*                        FAULT         =1
                                ;;*****************************************************************
     040410                     TST211:
6620 040410  000004                     SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                ;ERROR/LOOP ON TEST
     040412  040422                     .WORD   40$             ;TEST START LOCATION
     040414  060004                     .WORD   1$-40$+57764    ;LOOP ON ERROR START LOCATION
     040416  060030                     .WORD   20$-40$+57764   ;SCOPE SYNC LOCATION
     040420  060040                     .WORD   25$-40$+57764   ;LOOP ON ERROR END LOCATION
     040422  012737  001015  177746 40$: MOV     #OFF,CCR        ;DISABLE CACHE
     040430  004437  002342             JSR     R4,RELCTL       ;LOCATE TEST CODE TO LOW CACHE SPACE
     040434  040526                     .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO LOW CACHE SPACE

6621 040436  005037  070000             CLR     70000           ;ALL 0'S TO MAIN MEMORY LOC. 70000
6622 040442  112737  000002  177750 1$: MOVB    #HODO,CMR       ;HODO ALLOWS READ HITS TO BE CACHED,CACHE UPDATES,AND
6623                                                            ;CLOCKING OF OUTPUT OF CACHE HIT NAND
6624                                                            ;GATE INTO CMR ONLY DURING THE DESTINATION
6625                                                            ;ACCESS OF AN INSTRUCTION.
6626 040450  012737  000015  177746     MOV     #15,CCR         ;NO UCB SO AS TO WRITE CACHE STORES
6627                                                            ;DISABLE HI CACHE
6628 040456  005737  050000             TST     50000           ;
6629 040462  005737  070000             TST     70000           ;READ UPDATE HI CACHE LOCATION 4000
6630 040466  005737  070000         20$: TST    70000           ;READ HIT; CLOCK STATUS OF NAND GATE
6631                                                            ;OUTPUT TO CMR<8>
6632 040472  013701  177750             MOV     CMR,R1          ;SAVE CMR CONTENTS
6633 040476  000240                 25$: NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     040500  000240                     NOP                     ;FOR  LOOP ON ERROR
6634 040502  012737  001015  177746     MOV     #OFF,CCR        ;DISABLE CACHE
6635 040510  032701  000400             BIT     #HIT,R1         ;WAS CACHE HIT SIGNAL A 1
6636 040514  001003                     BNE     10$             ;PASS
6637 040516  104406                     ERROR                   ;ERROR
                                                                ;-----
     040520  040516                     .WORD   .-2
6638                                                            ;CACHE HIT TESTS
6639                                                            ;READING OUTPUT OF CACHE HIT NAND GATE
```

```
                                                                    ;THRU CMR<8> DID NOT RESULT IN A 1
6640
6641 040522  000000                        .WORD   0
6642 040524  000240                10$:    NOP                     ;END OF TEST
     040526  005237  001472                INC     $TESTN          ;INCREMENT TEST COUNTER
```

TEST # 212 - 'UNCONDITIONAL CACHE BYPASS' NO HIT CHECK

```
                                .SBTTL  TEST # 212 - 'UNCONDITIONAL CACHE BYPASS' NO HIT CHECK
                                ;;*****************************************************************
                                ;*TEST 212 - 'UNCONDITIONAL CACHE BYPASS' NO HIT CHECK
                                ;*      VERIFY THAT AN 'UNCONDITIONAL CACHE BYPASS' WILL INHIBIT CACHE HIT NAND GATE
                                ;*      FROM INDICATING A CACHE HIT.
                                ;*      PROCEDURE:      CAUSE A READ HIT TO LO CACHE WITH UCB ENABLED
                                ;*                      VERIFY THAT THE OUTPUT OF CACHE HIT NAND GATE
                                ;*                      WILL READ AS A 1 THRU CMR<8>.
                                ;*              CONDITIONS:     INPUTS CACHE HIT NAND GATE:
                                ;*                      COMPARE 1       =1
                                ;*                      COMPARE 2       =1
                                ;*                      COMPARE 3       =1
                                ;*                      VALID           =1
                                ;*                      TAG PAR. ERR    =1
                                ;*                      HI BYTE PE      =1
                                ;*                      LO BYTE PE      =1
                                ;*                      MISS HI         =1
                                ;*                      MISS LO         =1
                                ;*                      BYPASS/WRITE    =0
                                ;*                      FAULT           =1
                                ;;*****************************************************************
     040532
                                TST212:
6663 040532  000004                     SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                ;ERROR/LOOP ON TEST
     040534  040544                     .WORD   40$             ;TEST START LOCATION
     040536  070004                     .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     040540  070036                     .WORD   20$-40$+67764   ;SCOPE SYNC. LOCATION
     040542  070054                     .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     040544  012737  001015  177746 40$: MOV     #OFF,CCR        ;DISABLE CACHE
     040552  004437  002370             JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     040556  040656                     .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO HI CACHE SPACE

6664 040560  005037  060000             CLR     60000           ;ALL 0'S TO MAIN MEMORY LOCATION 60000
6665 040564  112737  000002  177750 1$: MOVB    #HODO,CMR       ;HODO ALLOWS READ HITS TO BE CACHED,CACHE UPDATES,AND
6666                                                            ;CLOCKING OF OUTPUT OF CACHE HIT NAND
6667                                                            ;GATE INTO CMR ONLY DURING THE DESTINATION
6668                                                            ;ACCESS OF AN INSTRUCTION.
6669 040572  012737  000011  177746     MOV     #11,CCR         ;NO UCB SO AS TO UPDATE CACHE STORES
6670                                                            ;ENABLE LOW CACHE
6671 040600  005737  040000             TST     40000           ;
6672 040604  005737  060000             TST     60000           ;READ UPDATE TO LOW CACHE LOCATION 0000
6673 040610  052737  001000  177746     BIS     #UCB,CCR        ;ENABLE UCB
6674 040616  005737  060000         20$: TST    60000           ;READ HIT; CLOCK STATUS OF NAND GATE
6675                                                            ;OUTPUT TO CMR<8>
6676 040622  013701  177750             MOV     CMR,R1          ;SAVE CMR CONTENTS
6677 040626  012737  001015  177746     MOV     #OFF,CCR        ;DISABLE CACHE
6678 040634  000240                 25$: NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     040636  000240                     NOP                     ;FOR  LOOP ON ERROR
6679 040640  032701  000400             BIT     #HIT,R1         ;WAS CACHE HIT SIGNAL A 1
6680 040644  001003                     BNE     10$             ;PASS
6681 040646  104406                     ERROR                   ;ERROR
                                                                ;-----
     040650  040646                     .WORD   .-2
6682                                                            ;CACHE HIT TESTS
```

TEST # 212 - 'UNCONDITIONAL CACHE BYPASS' NO HIT CHECK

```
 6683                                                          ;READING OUTPUT OF CACHE HIT NAND GATE
 6684                                                          ;THRU CMR<8> DID NOT RESULT ;N A 1
 6685 040652  000000                    .WORD   0
 6686 040654  000240            10$:    NOP                    ;END OF TEST
      040656  005237  001472            INC     $TESTN         ;INCREMENT TEST COUNTER
```

```
6711                                    .SBTTL  TEST # 213 - 'VALID' INPUT TO NAND INHIBITS IND. CACHE HIT
                                        ;;*********************************************************************
                                        ;*TEST 213 - 'VALID' INPUT TO NAND INHIBITS IND. CACHE HIT
                                        ;*      VERIFY THAT 'VALID' INPUT TO CACHE HIT NAND GATE WILL INHIBIT NAND
                                        ;*      GATE FROM INDICATING A CACHE HIT.
                                        ;*      PROCEDURE:      CREATE A CONDITION WHERE ONLY VALID INPUT ON
                                        ;*                      CACHE HIT NAND GATE INHIBITS  NAND GATE:
                                        ;*                              1.UPDATE CACHE LOCATION 0000
                                        ;*                              2.CAUSE INVALIDATION BY A WRITE HIT
                                        ;*                                IN BYPASS MODE
                                        ;*                              3.CAUSE READ HIT
                                        ;*                      VERIFY THAT OUTPUT OF NAND GATE
                                        ;*                      WILL READ AS A 1 THRU CMR<8>.
                                        ;*      CONDITIONS:     INPUTS CACHE HIT NAND GATE:
                                        ;*                        COMPARE 1     =1
                                        ;*                        COMPARE 2     =1
                                        ;*                        COMPARE 3     =1
                                        ;*                        VALID         =0
                                        ;*                        TAG PAR. ERR  =1
                                        ;*                        HI BYTE PE    =1
                                        ;*                        LO BYTE PE    =1
                                        ;*                        MISS HI       =1
                                        ;*                        MISS LO       =1
                                        ;*                        BYPASS/WRITE  =1
                                        ;*                        FAULT         =1
                                        ;;*********************************************************************
     040662                             TST213:
6712 040662  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     040664  040674                             .WORD   40$             ;TEST START LOCATION
     040666  070012                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     040670  070054                             .WORD   20$-40$+67764   ;SCOPE SYNC. LOCATION
     040672  070064                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     040674  012737  001015  177746     40$:    MOV     #OFF,CCR        ;DISABLE CACHE
     040702  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     040706  041024                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

6713 040710  005000                             CLR     R0              ;CLEAR R0
6714 040712  005037  060000                     CLR     60000           ;ALL 0'S TO MAIN MEMORY LOC. 60000
6715 040716  012701  060000                     MOV     #60000,R1       ;ADDRESS 60000 TO R1
6716 040722  112737  000002  177750     1$:     MOVB    #HODO,CMR       ;HODO ALLOWS READ HITS TO BE CACHED,CACHE UPDATES,AND
6717                                                                    ;CLOCKING OF OUTPUT OF CACHE HIT NAND
6718                                                                    ;GATE INTO CMR ONLY DURING THE DESTINATION
6719                                                                    ;ACCESS OF AN INSTRUCTION.
6720 040730  012737  000011  177746             MOV     #11,CCR         ;NO UCB SO AS TO WRITE CACHE STORES
6721                                                                    ;ENABLE LO CACHE
6722 040736  005737  040000                     TST     40000           ;
6723 040742  005737  060000                     TST     60000           ;READ UPDATE; ASSURE CORRECT PARITY IS WRITTEN
6724                                                                    ;FOR CACHE LOCATION 0000
6725 040746  052737  001000  177746             BIS     #UCB,CCR        ;SET UCB SO AS TO INVALIDATE CACHE LOCATIONS
6726                                                                    ;DURING WRITE HIT
6727 040754  010011                             MOV     R0,(R1)         ;CAUSE WRITE HIT TO LOCATION 60000;
6728                                                                    ;UCB CAUSES CACHE LOC. 0000 TO BE INVALIDATED
6729 040756  042737  001000  177746             BIC     #UCB,CCR        ;CLEAR UCB
```

TEST # 213 - 'VALID' INPUT TO NAND INHIBITS IND. CACHE HIT

```
 6730 040764  005737  060000          20$:    TST     60000          ;READ UPDATE CAUSED BY VALID STORE
 6731                                                                ;INVALIDATED; ALL INPUTS TO CACHE HIT NAND GATE
 6732                                                                ;ARE 1 EXCEPT VALID.CLOCK STATUS OF NAND GATE
 6733                                                                ;OUTPUT TO CMR<8>
 6734 040770  013702  177750                 MOV     CMR,R2         ;SAVE CMR CONTENTS
 6735 040774  000240                 25$:    NOP                    ;INSTRUCTION 'JMP 1$' PLACED HERE
      040776  000240                         NOP                    ;FOR  LOOP ON ERROR
 6736 041000  012737  001015  177746         MOV     #OFF,CCR       ;DISABLE CACHE
 6737 041006  032702  000400                 BIT     #HIT,R2        ;WAS CACHE HIT SIGNAL A 1
 6738 041012  001003                         BNE     10$            ;PASS
 6739 041014  104406                         ERROR                  ;ERROR
                                                                    ;-----
      041016  041014                         .WORD   .-2
 6740                                                                ;CACHE HIT TESTS
 6741                                                                ;READING OUTPUT OF CACHE HIT NAND GATE
 6742                                                                ;THRU CMR<8> DID NOT RESULT IN A 1
 6743 041020  000000                         .WORD   0
 6744 041022  000240                 10$:    NOP                    ;END OF TEST
      041024  005237  001472                 INC     $TESTN         ;INCREMENT TEST COUNTER
```

TEST # 214 - 'COMPARE 1" INPUT STOPS GATE FROM IND. HIT

```
6765                                    .SBTTL  TEST # 214 - 'COMPARE 1" INPUT STOPS GATE FROM IND. HIT
                                        ;;*****************************************************************
                                        ;*TEST 214 - 'COMPARE 1" INPUT STOPS GATE FROM IND. HIT
                                        ;*      VERIFY THAT 'COMPARE 1" INPUT TO CACHE HIT NAND GATE CAN INHIBIT
                                        ;*      NAND GATE FROM INDICATING A CACHE HIT.
                                        ;*      PROCEDURE:      CREATE A READ UPDATE TO LOW CACHE  CAUSED BY ONLY
                                        ;*                      BIT 18 ON CACHE ADDRESS LINE BEING DIFFERENT
                                        ;*                      FROM BIT 18 IN TAG STORE. VERIFY THAT OUTPUT  OF CACHE HIT
                                        ;*                      NAND GATE WILL READ AS A 1 THRU CMR<8>.
                                        ;*      CONDITIONS:     INPUTS CACHE HIT NAND GATE:
                                        ;*                        COMPARE 1     =0
                                        ;*                        COMPARE 2     =1
                                        ;*                        COMPARE 3     =1
                                        ;*                        VALID         =1
                                        ;*                        TAG PAR. ERR  =1
                                        ;*                        HI BYTE PE    =1
                                        ;*                        LO BYTE PE    =1
                                        ;*                        MISS HI       =1
                                        ;*                        MISS LO       =1
                                        ;*                        BYPASS/WRITE  =1
                                        ;*                        FAULT         =1
                                        ;;*****************************************************************
     041030
6766 041030  000004                     TST214:
                                                SCPCND                          ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                                ;ERROR/LOOP ON TEST
     041032  041042                             .WORD   40$                     ;TEST START LOCATION
     041034  070000                             .WORD   1$-40$+67764            ;LOOP ON ERROR START LOCATION
     041036  070066                             .WORD   20$-40$+67764           ;SCOPE SYNC. LOCATION
     041040  070106                             .WORD   25$-40$+67764           ;LOOP ON ERROR END LOCATION
     041042  012737  001015  177746     40$:    MOV     #OFF,CCR                ;DISABLE CACHE
     041050  004437  002370                     JSR     R4,RELCTH               ;LOCATE TEST CODE TO HIGH CACHE SPACE
     041054  041236                             .WORD   10$+2                   ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

6767 041056  012737  070100  000004     1$:     MOV     #3$-1$+70000,4          ;SETUP FOR POTENTIAL TRAP
6768 041064  012737  000340  000006             MOV     #340,6
6769 041072  012737  010000  172350             MOV     #10000,KPAR4            ;MAP PAGE 4 FOR 128K-132K ADDRESSING
6770 041100  012700  100000                     MOV     #100000,R0              ;LOAD VIRTUAL ADDRESS IN R0.WHEN MEMORY
6771                                                                            ;MANAGEMENT IS ENABLED,PAGE 4 WILL
6772                                                                            ;BE SELECTED AND ADDRESS 10000000
6773                                                                            ;WILL BE ACCESSED.
6774 041104  012737  000001  177572             MOV     #1,SR0                  ;ENABLE MEM. MNGMENT.
6775 041112  012737  000020  172516             MOV     #20,SR3                 ;ENABLE 22-BIT MAPPING
6776 041120  112737  000002  177750             MOVB    #HODO,CMR               ;HODO ALLOWS READ HITS,UPDATES, AND
6777                                                                            ;CLOCKING OF OUTPUT OF CACHE HIT NAND
6778                                                                            ;GATE INTO CMR ONLY DURING THE DESTINATION
6779                                                                            ;ACCESS OF AN INSTRUCTION.
6780 041126  012737  000011  177746             MOV     #11,CCR                 ;NO UCB SO AS TO WRITE CACHE STORES
6781                                                                            ;ENABLE LOW CACHE
6782 041134  005737  040000                     TST     40000                   ;
6783 041140  005737  000000                     TST     0                       ;READ UPDATE; ASSURE ALL 0'S IN TAG STORE
6784                                                                            ;LOCATION 0000,AND CORRECT PARITY IS WRITTEN.
6785 041144  005710                     20$:    TST     (R0)                    ;READ UPDATE TO CACHE LOCATION 0000
6786                                                                            ;CAUSED BY BIT 18 ON CACHE ADDRESS LINE
6787                                                                            ;DIFFERENT FROM TAG STORE BIT 18.
```

```
6788                                                                    ; CLOCK STATUS OF NAND GATE
6789                                                                    ;OUTPUT TO CMR<8>
6790 041146  000240                          NOP
6791 041150  013701  177750                 MOV     CMR,R1             ;SAVE CMR CONTENTS
6792 041154  000403                         BR      25$
6793 041156  013701  177750          3$:    MOV     CMR,R1             ;IF TRAP OCCURS WILL RETURN HERE
6794 041162  022626                         CMP     (SP)+,(SP)+        ;ADJUST STACK AND VECTORS
6795 041164  000240                  25$:   NOP                        ;INSTRUCTION 'JMP 1$' PLACED HERE
     041166  000240                         NOP                        ;FOR  LOOP ON ERROR
6796 041170  005037  177572                 CLR     SR0                ;DISABLE MEM. MNGMENT.
6797 041174  005037  172516                 CLR     SR3                ;DISABLE 22 BIT MAPPING
6798 041200  012737  001015  177746         MOV     #OFF,CCR           ;DISABLE CACHE
6799 041206  012737  000006  000004         MOV     #6,4               ;RESTORE VECTORS
6800 041214  005037  000006                 CLR     6
6801 041220  032701  000400                 BIT     #HIT,R1            ;WAS CACHE HIT SIGNAL A 1
6802 041224  001003                         BNE     10$                ;PASS
6803 041226  104406                         ERROR                      ;ERROR
                                                                        ;-----
     041230  041226                         .WORD   .-2
6804                                                                    ;CACHE HIT TESTS
6805                                                                    ;READING OUTPUT OF CACHE HIT NAND GATE
6806                                                                    ;THRU CMR<8> DID NOT RESULT IN A 1
6807 041232  000000                         .WORD   0
6808 041234  000240                  10$:   NOP                        ;END OF TEST
     041236  005237  001472                 INC     $TESTN             ;INCREMENT TEST COUNTER
```

TEST # 215 - 'COMPARE 2' INPUT STOPS NAND FROM IND. HIT

```
6829                                    .SBTTL  TEST # 215 - 'COMPARE 2' INPUT STOPS NAND FROM IND. HIT
                                        ;;*****************************************************************
                                        ;*TEST 215 - 'COMPARE 2' INPUT STOPS NAND FROM IND. HIT
                                        ;*      VERIFY THAT 'COMPARE 2' INPUT TO CACHE HIT NAND GATE CAN INHIBIT
                                        ;*      NAND GATE FROM INDICATING A CACHE HIT.
                                        ;*      PROCEDURE:      CREATE A READ UPDATE TO LOW CACHE  CAUSED BY ONLY
                                        ;*                      BIT 14 ON CACHE ADDRESS LINE BEING DIFFERENT
                                        ;*                      FROM BIT 14 IN TAG STORE. VERIFY THAT OUTPUT  OF CACHE HIT
                                        ;*                      NAND GATE WILL READ AS A 1 THRU CMR<8>.
                                        ;*      CONDITIONS:     INPUTS CACHE HIT NAND GATE:
                                        ;*                        COMPARE 1     =1
                                        ;*                        COMPARE 2     =0
                                        ;*                        COMPARE 3     =1
                                        ;*                        VALID         =1
                                        ;*                        TAG PAR. ERR  =1
                                        ;*                        HI BYTE PE    =1
                                        ;*                        LO BYTE PE    =1
                                        ;*                        MISS HI       =1
                                        ;*                        MISS LO       =1
                                        ;*                        BYPASS/WRITE  =1
                                        ;*                        FAULT         =1
                                        ;;*****************************************************************
     041242                             TST215:
6830 041242  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     041244  041254                             .WORD   40$             ;TEST START LOCATION
     041246  070000                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     041250  070024                             .WORD   20$-40$+67764   ;SCOPE SYNC. LOCATION
     041252  070034                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     041254  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     041262  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     041266  041354                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

6831 041270  112737  000002  177750  1$:       MOVB    #HODO,CMR       ;HODO ALLOWS READ HITS,UPDATES, AND
6832                                                                    ;CLOCKING OF OUTPUT OF CACHE HIT NAND
6833                                                                    ;GATE INTO CMR ONLY DURING THE DESTINATION
6834                                                                    ;ACCESS OF AN INSTRUCTION.
6835 041276  012737  000011  177746            MOV     #11,CCR         ;NO UCB SO AS TO WRITE CACHE STORES
6836                                                                    ;ENABLE LOW CACHE
6837 041304  005737  040000                     TST     40000           ;
6838 041310  005737  000000                     TST     0               ;READ UPDATE; ASSURE ALL 0'S IN TAG STORE
6839                                                                    ;LOCATION 0000,AND CORRECT PARITY IS WRITTEN.
6840 041314  005737  040000          20$:       TST     40000           ;READ UPDATE TO CACHE LOCATION 0000
6841                                                                    ;CAUSED BY BIT 14 ON CACHE ADDRESS LINE
6842                                                                    ;DIFFERENT FROM TAG STORE BIT 14.
6843                                                                    ; CLOCK STATUS OF NAND GATE
6844                                                                    ;OUTPUT TO CMR<8>
6845 041320  013701  177750                     MOV     CMR,R1          ;SAVE CMR CONTENTS
6846 041324  000240                  25$:       NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     041326  000240                             NOP                     ;FOR  LOOP ON ERROR
6847 041330  012737  001015  177746            MOV     #OFF,CCR        ;DISABLE CACHE
6848 041336  032701  000400                     BIT     #HIT,R1         ;WAS CACHE HIT SIGNAL A 1
6849 041342  001003                             BNE     10$             ;PASS
6850 041344  104406                             ERROR                   ;ERROR
```

```
                                                                        ;-----
      041346  041344                          .WORD   .-2
 6851
 6852                                                                   ;CACHE HIT TESTS
 6853                                                                   ;READING OUTPUT OF CACHE HIT NAND GATE
 6854 041350  000000                          .WORD   0                 ;THRU CMR<8> DID NOT RESULT IN A 1
 6855 041352  000240                  10$:    NOP                       ;END OF TEST
      041354  005237  001472                  INC     $TESTN            ;INCREMENT TEST COUNTER
```

```
   6877                                 .SBTTL  TEST # 216 - 'COMPARE 3' INPUT STOPS GATE FROM IND. HIT
                                        ;;*****************************************************************
                                        ;*TEST 216 - 'COMPARE 3' INPUT STOPS GATE FROM IND. HIT
                                        ;*      VERIFY THAT 'COMPARE 3' INPUT TO CACHE NAND GATE WILL INHIBIT NAND GATE
                                        ;*      FROM INDICATING A CACH HIT.
                                        ;*      PROCEDURE:      CREATE A READ UPDATE TO LO CACHE CAUSED BY
                                        ;*                      ONLY  BIT 13 ON CACHE ADDRESS LINE BEING
                                        ;*                      DIFFERENT FROM BIT 13 IN TAG STORE.
                                        ;*                      VERIFY THAT THE OUTPUT OF CACHE HIT NAND GATE
                                        ;*                      WILL READ AS A 1 THRU CMR<8>.
                                        ;*      CONDITIONS:     INPUTS CACHE HIT NAND GATE:
                                        ;*                        COMPARE 1     =1
                                        ;*                        COMPARE 2     =1
                                        ;*                        COMPARE 3     =0
                                        ;*                        VALID         =1
                                        ;*                        TAG PAR. ERR  =1
                                        ;*                        HI BYTE PE    =1
                                        ;*                        LO BYTE PE    =1
                                        ;*                        MISS HI       =1
                                        ;*                        MISS LO       =1
                                        ;*                        BYPASS/WRITE  =1
                                        ;*                        FAULT         =1
                                        ;;*****************************************************************
        041360                          TST216:
   6878 041360  000004                          SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
        041362  041372                  .WORD   40$                     ;TEST START LOCATION
        041364  070000                  .WORD   1$-40$+67764            ;LOOP ON ERROR START LOCATION
        041366  070024                  .WORD   20$-40$+67764           ;SCOPE SYNC. LOCATION
        041370  070034                  .WORD   25$-40$+67764           ;LOOP ON ERROR END LOCATION
        041372  012737  001015  177746  40$:    MOV     #OFF,CCR        ;DISABLE CACHE
        041400  004437  002370          JSR     R4,RELCTH               ;LOCATE TEST CODE TO HIGH CACHE SPACE
        041404  041472                  .WORD   10$+2                   ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

   6879 041406  112737  000002  177750  1$:     MOVB    #HODO,CMR       ;HODO ALLOWS READ HITS,UPDATES, AND
   6880                                                                 ;CLOCKING OF OUTPUT OF CACHE HIT NAND
   6881                                                                 ;GATE INTO CMR ONLY DURING THE DESTINATION
   6882                                                                 ;ACCESS OF AN INSTRUCTION.
   6883 041414  012737  000011  177746          MOV     #11,CCR         ;NO UCB SO AS TO UPDATE CACHE STORES
   6884                                                                 ;ENABLE LOW CACHE
   6885 041422  005737  020000                  TST     20000           ;
   6886 041426  005737  000000                  TST     0               ;READ UPDATE; ASSURE ALL 0'S IN TAG
   6887                                                                 ;STORE LOCATION 0000 AND CORRECT PARITY
   6888                                                                 ;IS WRITTEN.
   6889 041432  005737  020000          20$:    TST     20000           ;READ UPDATE TO CACHE LOC. 0000 CAUSED BY
   6890                                                                 ;BIT 13 ON CACHE ADDRESS LINES BEING
   6891                                                                 ;DIFFERENT FROM BIT 13 IN TAG STORE.
   6892                                                                 ;CLOCK STATUS OF CACHE HIT NAND GATE
   6893                                                                 ;OUTPUT TO CMR<8>
   6894 041436  013701  177750                  MOV     CMR,R1          ;SAVE CMR CONTENTS
   6895 041442  000240          25$:    NOP                             ;INSTRUCTION 'JMP 1$' PLACED HERE
        041444  000240                  NOP                             ;FOR  LOOP ON ERROR
   6896 041446  012737  001015  177746          MOV     #OFF,CCR        ;DISABLE CACHE
   6897 041454  032701  000400                  BIT     #HIT,R1         ;WAS CACHE HIT SIGNAL A 1
```

TEST # 216 - 'COMPARE 3' INPUT STOPS GATE FROM IND. HIT

```
 6898 041460  001003                        BNE     10$             ;PASS
 6899 041462  104406                        ERROR                   ;ERROR
                                                                    ;-----
      041464  041462                        .WORD   .-2
 6900                                                               ;CACHE HIT TESTS
 6901                                                               ;READING OUTPUT OF CACHE HIT NAND GATE
 6902                                                               ;THRU CMR<8> DID NOT RESULT IN A 1
 6903 041466  000000                        .WORD   0
 6904 041470  000240                 10$:   NOP                     ;END OF TEST
      041472  005237  001472                INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 217 - CACHE READ HIT RESULTS IN PROPER OUTPUT
                                ;;*****************************************************************
                                ;*TEST 217 - CACHE READ HIT RESULTS IN PROPER OUTPUT
                                ;*      VERIFY THAT A CACHE READ HIT WILL RESULT IN DATA BEING READ
                                ;*      FROM CACHE DATA STORE, ASSURING THAT THE CACHE HAS ISSUED A
                                ;*      A CPU CLOCK RESTART SIGNAL.  ASSURE THAT ALL 0'S CAN BE CACHED
                                ;*      OUT OF CACHE DATA STORE.
                                ;;*****************************************************************
     041476                     TST217:
6912 041476  000004                        SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                   ;ERROR/LOOP ON TEST
     041500  041510                        .WORD   40$             ;TEST START LOCATION
     041502  070000                        .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     041504  000000                        .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     041506  070106                        .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     041510  012737  001015  177746 40$:    MOV     #OFF,CCR        ;DISABLE CACHE
     041516  004437  002370                JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     041522  041754                        .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO HI CACHE SPACE

6913 041524  012701  040000    1$:     MOV     #40000,R1       ;ADDRESS 40000 TO R1
6914 041530  012702  060000            MOV     #60000,R2       ;ADDRESS 60000 TO R2
6915 041534  012737  070076  000014    MOV     #3$-1$+70000,14 ;SETUP BPT TRAP VECTORS
6916 041542  012737  000340  000016    MOV     #340,16
6917 041550  005037  002070            CLR     FAIL1           ;CLEAR ERROR FLAGS
6918 041554  005037  002072            CLR     FAIL2
6919 041560  012706  060002            MOV     #60002,SP       ;STACK POINTER NOW POINTS TO ADDRESS 60002
6920 041564  005037  060000            CLR     60000           ;PRECONDITION MAIN MEMORY ADDRESS LOCATION
6921                                                           ;60000 WITH ALL 0'S
6922 041570  012737  000340  177776    MOV     #340,PSW        ;PRECONDITION PSW TO 340
6923 041576  112737  000002  177750    MOVB    #HODO,CMR       ;HODO WILL ALLOW READ HITS AND UPDATES
6924                                                           ;ONLY DURING THE DESTINATION MEMORY ACCESS
6925                                                           ;OF AN INSTRUCTION.
6926                                                           ;HODO DOES NOT ALLOW A CACHE UPDATE
6927                                                           ;TO OCCUR DUE TO WRITE UPDATES.
6928 041604  012737  000011  177746    MOV     #11,CCR         ;NO BYPASS TO ALLOW WRITES TO CACHE STORES.
6929                                                           ;ENABLE LOW CACHE
6930 041612  000257                    CCC                     ;CLEAR ALL CONDITION CODES
6931 041614  005711                    TST     (R1)            ;
6932 041616  005712                    TST     (R2)            ;CACHE READ UPDATE. WRITE ALL 0'S FROM
6933                                                           ;MAIN MEMORY LOCATION TO CACHE DATA STORE
6934                                                           ;LOCATION 0000.
6935 041620  000003                    BPT                     ;BREAKPOINT TRAP. DUE TO A TRAP,THE  PSW
6936                                                           ;WILL BE WRITTEN TO THE STACK, WHICH NOW
6937                                                           ;POINTS TO ADDRESS 60000.THE TRAP INSTRUCTION
6938                                                           ;IS A NON-DESTINATION ACCESS INSTR.
6939                                                           ;SINCE HODO IS BEING USED, A CACHE UPDATE
6940                                                           ;WILL BE INHIBITED. MAIN MEMORY
6941                                                           ;ADDRESS 60000 WILL CONTAIN PSW  DATA OF 344,AND
6942                                                           ;THE LOCATION IN CACHE CORRESPONDING TO ADDRESS
6943                                                           ;60000 WILL BE LEFT WITH ALL 0'S DATA.
6944 041622  042737  000002  177750 3$:     BIC     #HODO,CMR       ;TRAP TO HERE;DISABLE HODO
6945 041630  011200                    MOV     (R2),R0         ; WHEN THIS INSTRUCTION READS
6946                                                           ;ADDRESS 60000
6947                                                           ;A CACHE READ HIT SHOULD RESULT AND A CPU CLOCK
```

```
                                                        ;RESTART SIGNAL SHOULD BE ISSUED.
                                                        ;THE CPU SHOULD READ DATA FROM CACHE DATA STORE
                                                        ;RATHER THAN MAIN MEMORY.
041632  000240                  25$:    NOP             ;INSTRUCTION 'JMP 1$' PLACED HERE
041634  000240                          NOP             ;FOR  LOOP ON ERROR
041636  005700                          TST     R0      ;R0 SHOULD CONTAIN ALL 0'S
041640  001410                          BEQ     7$      ;
041642  022700  000344                  CMP     #344,R0 ;DID THE CPU READ MAIN MEMORY?
041646  001003                          BNE     6$      ;NO,MUST HAVE READ CACHE BUT BAD DATA WAS RECEIVED.
041650  005237  002070                  INC     FAIL1   ;INDICATE ERROR THAT MAIN MEMORY WAS READ
041654  000402                          BR      7$
041656  005237  002072          6$:     INC     FAIL2   ;INDICATE ERROR THAT DATA WAS CACHED BUT
                                                        ;BAD DATA WAS RECEIVED.
041662  105037  177750          7$:     CLRB    CMR     ;DISABLE MAINTENANCE MODE
041666  012737  001015  177746          MOV     #OFF,CCR ;DISABLE CACHE
041674  012706  000500                  MOV     #500,SP ;RESET STACK POINTER
041700  012737  000016  000014          MOV     #16,14  ;RESTORE BPT VECTORS
041706  005037  000016                  CLR     16
041712  005737  002070                  TST     FAIL1   ;WAS MAIN MEMORY READ?
041716  001404                          BEQ     8$      ;NO
041720  104406                          ERROR           ;ERROR
                                                        ;-----
041722  041720                          .WORD   .-2
                                                        ;CPU CLOCK RESTART-CACHED DATA TESTS
                                                        ;ATTEMPTING TO CAUSE A READ HIT IN ORDER TO
                                                        ;CACHE DATA RESULTED IN MAIN MEMORY BEING READ
041724  000000                          .WORD   0
041726  000411                          BR      10$     ;NEXT TEST
041730  005737  002072          8$:     TST     FAIL2   ;WAS BAD DATA CACHED FROM CACHE DATA STORE?
041734  001406                          BEQ     10$     ;NO, NEXT TEST
041736  010037  047346                  MOV     R0,RECDAT ;SPECIFY DATA RECEIVED
041742  104406                          ERROR           ;ERROR
                                                        ;-----
041744  041742                          .WORD   .-2
                                                        ;CPU CLOCK RESTART-CACHED DATA TESTS
                                                        ;CREATING A READ HIT BY READING ADDRESS 60000
                                                        ;CACHED BAD DATA FROM CACHE DATA STORE
041746  047346                  RECDAT  .WORD           ;PRINT DATA RECEIVED
041750  000000                          .WORD   0
041752  000240          10$:    NOP                     ;END OF TEST
041754  005237  001472                  INC     $TESTN  ;INCREMENT TEST COUNTER
```

```
                                        .SBTTL  TEST # 220 - FLOATING 1 CAN BE CACHED FROM DATA STORE
                                        ;;*****************************************************************
                                        ;*TEST 220 - FLOATING 1 CAN BE CACHED FROM DATA STORE
                                        ;*      VERIFY THAT A FLOATING 1 ACROSS 0'S DATA PATTERN CAN BE CACHED
                                        ;*      FROM CACHE DATA STORE.
                                        ;;*****************************************************************
     041760                             TST220:
6989 041760  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     041762  041772                             .WORD   40$             ;TEST START LOCATION
     041764  070016                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     041766  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     041770  070040                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     041772  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     042000  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     042004  042122                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

6990 042006  012701  040000                     MOV     #40000,R1       ;ADDRESS 40000 TO R1
6991 042012  012702  060000                     MOV     #60000,R2       ;ADDRESS 60000 TO R2
6992 042016  012737  000001  047344             MOV     #1,FLTPAT       ;1ST FLOATING 1 PATTERN: 000001
6993 042024  013737  047344  060000  1$:        MOV     FLTPAT,60000    ;WRITE FLOATING 1 PATTERN TO MAIN MEMORY
6994                                                                    ;LOCATION 60000
6995 042032  012737  000011  177746             MOV     #11,CCR         ;NO BYPASS TO ALLOW WRITES TO CACHE STORES.
6996                                                                    ;ENABLE LOW CACHE
6997 042040  005711                             TST     (R1)            ;
6998 042042  005712                             TST     (R2)            ;CACHE READ UPDATE. WRITE FLOATING 1 PATTERN FROM
6999                                                                    ;MAIN MEMORY LOCATION TO CACHE DATA STORE
7000                                                                    ;LOCATION 0000.
7001 042044  011200                             MOV     (R2),R0         ;WHEN THIS INSTRUCTION READS
7002                                                                    ;ADDRESS 60000,A CACHE READ HIT SHOULD RESULT
7003                                                                    ;AND A CPU CLOCK RESTART SIGNAL SHOULD BE ISSUED.
7004                                                                    ;THE CPU SHOULD READ FLOATING 1 PATTERN FROM CACHE DATA STOR
7005                                                                    ;RATHER THAN MAIN MEMORY.
7006 042046  000240                     25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     042050  000240                             NOP                     ;FOR  LOOP ON ERROR
7007 042052  012737  001015  177746             MOV     #OFF,CCR        ;DISABLE CACHE
7008 042060  020037  047344                     CMP     R0,FLTPAT       ;WAS THE CORRECT FLOATING 1 PATTERN RECEIVED
7009 042064  001412                             BEQ     9$              ;PASS
7010 042066  010037  047346                     MOV     R0,RECDAT       ;GET DATA RECEIVED
7011 042072  013737  047344  047332             MOV     FLTPAT,EXDAT6   ;GET EXPECTED DATA
7012 042100  104406                             ERROR                   ;ERROR
                                                                        ;-----
     042102  042100                             .WORD   .-2
7013                                                                    ;CPU CLOCK RESTART-CACHED DATA TESTS
7014                                                                    ;CREATING A READ HIT BY READING ADDRESS 60000
7015                                                                    ;RESULTED IN INCORRECT FLOATING 1 PATTERN
7016                                                                    ;BEING CACHED FROM CACHE DATA STORE
7017 042104  047332                     EXDAT6                         ;PRINT FLOATING 1 PATTERN EXPECTED FROM THE
7018                                                                    ;READ HIT TO ADDRESS 60000
7019 042106  047346                     RECDAT                         ;PRINT DATA RECEIVED FROM READ HIT TO ADDRESS 60000
7020 042110  000000                     .WORD   0
```

```
7021 042112  006337  047344          9$:     ASL     FLTPAT          ;NEXT FLOATING 1 PATTERN
7022 042116  103342                          BCC     1$              ;IF FLOATING 1 PATTERN 100000 HAS NOT BEEN
7023                                                                 ;DONE ,CONTINUE.
7024 042120  000240                  10$:    NOP                     ;END OF TEST
     042122  005237  001472                  INC     $TESTN          ;INCREMENT TEST COUNTER
```

TEST # 221 - DMA WRITE HITS STOPS ALL CACHE STORE LOCS

```
                                .SBTTL  TEST # 221 - DMA WRITE HITS STOPS ALL CACHE STORE LOCS
                                ;;*****************************************************************
                                ;*TEST 221 - DMA WRITE HITS STOPS ALL CACHE STORE LOCS
                                ;*      VERIFY THAT DMA WRITE HITS WILL INVALIDATE ALL OF LOW CACHE VALID
                                ;*      STORE LOCATIONS.
                                ;;*****************************************************************
      042126                    TST221:
7030  042126  000004                    SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                ;ERROR/LOOP ON TEST
      042130  042140                    .WORD   40$             ;TEST START LOCATION
      042132  070270                    .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
      042134  000000                    .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
      042136  070410                    .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
      042140  012737  001015  177746 40$:    MOV     #OFF,CCR        ;DISABLE CACHE
      042146  004437  002370            JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
      042152  042652                    .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO HI CACHE SPACE

7031  042154  032737  020000  177746          BIT     #VSIU,CCR       ;IS SET A BEING USED?
7032  042162  001407                    BEQ     7$              ;YES
7033  042164  052737  000400  177746          BIS     #FC,CCR         ;NO; FLUSH CACHE FOR SET A
7034  042172  032737  010000  177746 500$:    BIT     #VCIP,CCR       ;WAIT TILL FLUSH COMPLETE
7035  042200  001374                    BNE     500$
7036  042202  012705  060000          7$:     MOV     #60000,R5       ;;ADDRESS 60000 INTO R5
7037  042206  012703  040000                  MOV     #40000,R3       ;ADDRESS 40000 INTO R3
7038  042212  132737  000200  001507          BITB    #APTSIZE,$ENVM  ;WILL APT SIZE?
7039  042220  001405                    BEQ     3$              ;NO,GO AUTOSIZE
7040  042222  032737  010000  001512          BIT     #10000,$USWR    ;DOES APT SAY TO PERFORM TEST
7041  042230  001426                    BEQ     11$             ;APT SAYS DO NOT PERFORM TEST
7042  042232  000504                    BR      1$              ;APT SAYS DO TEST
7043  042234  012737  070116  000004 3$:     MOV     #5$-40$+67764,4 ;SETUP FOR TRAP
7044  042242  012737  000340  000006          MOV     #340,6
7045  042250  005737  170006                  TST     BECR1           ;ACCESS UNIBUS EXERCISER
7046  042254  000240                    NOP
7047  042256  012737  000006  000004          MOV     #6,4            ;RESTORE VECTORS
7048  042264  005037  000006                  CLR     6
7049  042270  000465                    BR      1$              ;UNIBUS EXERCISER IS PRESENT;PROCEED WITH TEST
7050  042272  022626                  5$:     CMP     (SP)+,(SP)+     ;TRAP RETURN;EXERCISER NOT PRESENT
7051  042274  012737  000006  0C0004          MOV     #6,4            ;RESTORE VECTORS
7052  042302  005037  000006                  CLR     6
7053  042306  005737  001474          11$:    TST     $PASS           ;IS THI SFIRST PASS?
7054  042312  001156                    BNE     10$             ;SKIP MESSAGE;SKIP TEST
7055  042314  023737  000042  000046          CMP     42,46           ;IS THIS ACT11 QV OR AUTO ACCEPT?
7056  042322  001552                    BEQ     10$             ;YES SKIP TYPEOUT
7057  042324  104401  042332                  TYPE    ,65$            ;;TYPE ASCIZ STRING
      042330  000402                    BR      64$             ;;GET OVER THE ASCIZ
      042332     200     200     000 65$:     .ASCIZ  <CRLF><CRLF>
                                        .EVEN
      042336                          64$:
7058  042336  104401  042344                  TYPE    ,67$            ;;TYPE ASCIZ STRING
      042342  000432                    BR      66$             ;;GET OVER THE ASCIZ
      042344     125     116     111 67$:     .ASCIZ  /UNIBUS  EXERCISER NOT USED- DMA TESTS NOT PERFORMED/
                                        .EVEN
      042430                          66$:
7059  042430  104401  042436                  TYPE    ,69$            ;;TYPE ASCIZ STRING
```

TEST # 221 - DMA WRITE HITS STOPS ALL CACHE STORE LOCS

```
        042434  000402                          BR      68$             ;;GET OVER THE ASCIZ
        042436    200     200     000  69$:     .ASCIZ  <CRLF><CRLF>
                                                .EVEN
        042442                               68$:
   7060 042442  000502                          BR      10$
   7061 042444  012737  000015  177746  1$:     MOV     #15,CCR         ;NO UCB SO AS TO WRITE ENABLE VALID STORE
   7062 042452  112737  000002  177750          MOVB    #HODO,CMR       ;HODO ALLOWS UPDATES ONLY DURING THE
   7063                                                                 ;DESTINATION ACCESS OF AN INSTRUCTION
   7064 042460  005723                       2$:     TST     (R3)+
   7065 042462  005725                               TST     (R5)+       ;UPDATE ALL LOW CACHE LOCATIONS MAKING
   7066                                                                 ;ALL VALID STORE  LOCATIONS =1
   7067 042464  022705  070000                       CMP     #70000,R5   ;COMPLETE?
   7068 042470  001373                               BNE     2$          ;NO
   7069 042472  042737  000002  177750          BIC     #HODO,CMR       ;CLEAR HODO SO VALID STORE CAN BE WRITTEN
   7070                                                                 ;BY UNIBUS EXERCISER.
   7071 042500  012705  060000                       MOV     #60000,R5   ;ADDRESS 60000 INTO R5
   7072 042504  012737  060000  170004          MOV     #60000,BEBA     ;SETUP UNIBUS EXERCISER
   7073                                                                 ;ADRESS
   7074 042512  012737  174000  170002          MOV     #-4000,BECC     ;TRANSFER COUNT
   7075 042520  012737  177777  170000          MOV     #177777,BEDA    ;DATA FOR WRITE XFER
   7076 042526  012737  000000  170016          MOV     #0,BECR2        ;SETUP CONTROL REGISTER 2
   7077 042534  012737  003045  170006          MOV     #3045,BECR1     ;SETUP CONTROL REGISTER 1;START XFER
   7078 042542  105737  170006          4$:     TSTB    BECR1           ;WAIT FOR EXERCISER TO COMPLETE
   7079 042546  100375                          BPL     4$
   7080 042550  052737  000002  177750  6$:     BIS     #HODO,CMR       ;IMPLEMENT HODO. ALLOWS VALID STORE
   7081                                                                 ;DATA TO BE WRITTEN TO CMR<12> ONLY
   7082                                                                 ;DURING THE DESTINATION MEMORY ACCESS
   7083                                                                 ;OF AN INSTRUCTION.
   7084 042556  005715                               TST     (R5)        ;READ LOW CACHE ADDRESS
   7085                                                                 ;LOCATION SPECIFIED BY R5'S BITS 12 TO 1.
   7086                                                                 ;WRITE VALID STORE DATA INTO CMR<12>
   7087                                                                 ;FROM VALID STORE ADDRESS LOCATION
   7088                                                                 ;JUST READ.
   7089 042560  013701  177750                  MOV     CMR,R1          ;SAVE CMR DATA
   7090 042564  000240                  25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
        042566  000240                          NOP                     ;FOR  LOOP ON ERROR
   7091 042570  012737  001015  177746          MOV     #OFF,CCR        ;DISABLE CACHE
   7092 042576  105037  177750                  CLRB    CMR             ;DISABLE MAINTENANCE
   7093 042602  032701  010000                  BIT     #VLD,R1         ;CMR<12> SHOULD BE 0.
   7094 042606  001411                          BEQ     9$              ;PASS
   7095 042610  010537  047334                  MOV     R5,CA121        ;SAVE VALID STORE ADDRESS LOCATION
   7096                                                                 ;USED: CA<12:1>
   7097 042614  006237  047334                  ASR     CA121           ;PREPARE CA121 FOR TYPEOUT
   7098 042620  104406                          ERROR                   ;ERROR
                                                                        ;-----
        042622  042620                          .WORD   .-2
   7099                                                                 ;DMA TESTS
   7100                                                                 ;READING VALID STORE DATA
   7101                                                                 ;THRU CMR<12> DID NOT RESULT IN 0.
   7102                                                                 ;THIS INDICATES THAT VALID STORE WAS
   7103                                                                 ;NOT INVALIDATED DUE TO DMA WRITE HIT.
   7104 042624  047334                          CA121                   ;PRINT VALID STORE ADDRESS LOCATION
   7105                                                                 ;USED: CA<12:1>.
   7106 042626  000000                          .WORD   0
   7107 042630  000407                          BR 10$                  ;IF ERROR END TEST
   7108 042632  062705  000002          9$:     ADD     #2,R5           ;NEXT VALID STORE LOCATION
   7109 042636  062703  000002                  ADD     #2,R3
```

TEST # 221 - DMA WRITE HITS STOPS ALL CACHE STORE LOCS

```
   7110 042642  020527  070000                CMP     R5,#70000       ;HAVE ALL LOW CACHE ADDRESS LOCATIONS
   7111                                                                ;BEEN DONE?
   7112 042646  001340                        BNE     6$              ;NO
   7113 042650  000240                10$:    NOP                     ;END OF TEST
        042652  005237  001472                INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
7118                                    .SBTTL  TEST # 222 - DMA WRITE CAUSES TIMEOUT & CCR REG NOT ALTERED
                                        ;;*****************************************************************
                                        ;*TEST 222 - DMA WRITE CAUSES TIMEOUT & CCR REG NOT ALTERED
                                        ;*      VERIFY THAT A DMA WRITE TO CCR REGISTER WILL RESULT IN A TIMEOUT
                                        ;*              AND THAT THE CCR REGISTER WILL NOT BE ALTERED
                                        ;;*****************************************************************
     042656                             TST222:
7119 042656  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                         ;ERROR/LOOP ON TEST
     042660  042670                              .WORD   40$             ;TEST START LOCATION
     042662  070134                              .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     042664  000000                              .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     042666  070276                              .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     042670  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     042676  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     042702  043246                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

7120 042704  032737  020000  177746             BIT     #VSIU,CCR       ;IS SET A BEING USED?
7121 042712  001407                             BEQ     7$              ;YES
7122 042714  052737  000400  177746             BIS     #FC,CCR         ;NO; FLUSH CACHE FOR SET A
7123 042722  032737  010000  177746  500$:      BIT     #VCIP,CCR       ;WAIT TILL FLUSH COMPLETE
7124 042730  001374                             BNE     500$
7125 042732  012705  060000            7$:      MOV     #60000,R5       ;;ADDRESS 60000 INTO R5
7126 042736  012703  040000                     MOV     #40000,R3       ;ADDRESS 40000 INTO R3
7127 042742  132737  000200  001507             BITB    #APTSIZE,$ENVM  ;WILL APT SIZE?
7128 042750  001405                             BEQ     3$              ;NO,GO AUTOSIZE
7129 042752  032737  010000  001512             BIT     #10000,$USWR    ;DOES APT SAY TO PERFORM TEST
7130 042760  001426                             BEQ     11$             ;APT SAYS DO NOT PERFORM TEST
7131 042762  000426                             BR      1$              ;APT SAYS DO TEST
7132 042764  012737  070116  000004  3$:        MOV     #5$-40$+67764,4 ;SETUP FOR TRAP
7133 042772  012737  000340  000006             MOV     #340,6
7134 043000  005737  170006                     TST     BECR1           ;ACCESS UNIBUS EXERCISER
7135 043004  000240                             NOP
7136 043006  012737  000006  000004             MOV     #6,4            ;RESTORE VECTORS
7137 043014  005037  000006                     CLR     6
7138 043020  000407                             BR      1$              ;UNIBUS EXERCISER  IS PRESENT;PROCEED WITH TEST
7139 043022  022626                     5$:     CMP     (SP)+,(SP)+     ;TRAP RETURN;EXERCISER NOT PRESENT
7140 043024  012737  000006  000004             MOV     #6,4            ;RESTORE VECTORS
7141 043032  005037  000006                     CLR     6
7142 043036  000502                     11$:    BR      10$             ;SKIP TEST
7143 043040  012737  000015  177746  1$:        MOV     #15,CCR         ;CACHE OFF-DISABLE INTERRUPT
7144 043046  012737  070256  000510             MOV     #6$-40$+67764,510;SETUP RETURN ADDRESS FOR
7145                                                                     ;A UNIBUS EXER, TRAP
7146 043054  012737  000340  000512             MOV     #340,512        ;
7147 043062  012737  177746  170004             MOV     #177746,BEBA    ;SETUP UNIBUS EXERCISER ADRESS
7148 043070  012737  177777  170002             MOV     #-1,BECC        ;TRANSFER COUNT
7149 043076  012737  001015  170000             MOV     #1015,BEDA      ;DATA FOR WRITE XFER
7150 043104  012737  000003  170016             MOV     #3,BECR2        ;SETUP CONTROL REGISTER 2
7151 043112  012737  003045  170006             MOV     #3045,BECR1     ;SETUP CONTROL REGISTER 1;START XFER
7152 043120  105737  170006            4$:      TSTB    BECR1           ;WAIT FOR EXERCISER TO COMPLETE
7153 043124  100375                             BPL     4$
7154 043126  012737  001000  002062             MOV     #1000,LOOP      ;GIVE ENOUGH TIME FOR TIMEOUT TO OCCUR
7155 043134  005337  002062            2$:      DEC     LOOP
7156 043140  001375                             BNE     2$
```

```
 7157 043142  013700  170016                MOV     BECR2,R0        ;SAVE UBE ERROR REGISTER CONTENTS
 7158 043146  013701  177746                MOV     CCR,R1          ;SAVE CCR CONTENTS
 7159 043152  005037  177776                CLR     PSW             ;ALLOW INTERRUPT TO OCCUR
 7160 043156  000240                        NOP
 7161 043160  000401                        BR      8$
 7162 043162  022626                6$:     CMP     (SP)+,(SP)+     ;TRAP TO HERE;ADJUST STACK
 7163 043164  012737  000512  000510  8$:   MOV     #512,510        ;RESTORE VECTORS
 7164 043172  005037  000512              CLR     512             ;
 7165 043176  005037  170010              CLR     170010          ;CLEAR ERROR REGISTER
 7166 043202  000240                25$:   NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
      043204  000240                       NOP                     ;FOR  LOOP ON ERROR
 7167 043206  012737  001015  177746        MOV     #OFF,CCR        ;DISABLE CACHE
 7168 043214  032700  000400              BIT     #400,R0         ;SLAVE SYNC ERROR BIT SHOULD BE SET
 7169 043220  001003                        BNE     9$              ;PASS
 7170 043222  104406                        ERROR                   ;ERROR
                                                                    ;-----
      043224  043222                       .WORD   .-2
 7171                                                               ;DMA TESTS
 7172                                                               ;ATTEMPTING A DMA WRITE TO CCR REGISTER
 7173                                                               ;DID NOT RESULT IN A SSYNC TIMEOUT
 7174                                                               ;OF THE UBE
 7175 043226  000000                        .WORD   0
 7176 043230  032701  001000          9$:   BIT     #1000,R1        ;CCR BIT 9 SHOULD NOT HAVE  BEEN WRITTEN TO
 7177                                                               ;BY THE UBE
 7178 043234  001403                        BEQ     10$             ;PASS
 7179 043236  104406                        ERROR                   ;ERROR
                                                                    ;-----
      043240  043236                       .WORD   .-2
 7180                                                               ;DMA TESTS
 7181                                                               ;ATTEMPTING A DMA WRITE TO CCR
 7182                                                               ;WROTE A 1 TO CCR BIT 9
 7183 043242  000000                        .WORD   0
 7184 043244  000240                10$:    NOP                     ;END OF TEST
      043246  005237  001472                INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 223 - ALL 6 HIT REG BITS READ 0 DUE TO 6 READ MISSES
                                ;;*****************************************************************
                                ;*TEST 223 - ALL 6 HIT REG BITS READ 0 DUE TO 6 READ MISSES
                                ;*      CHECK THAT ALL SIX HIT REGISTER BITS CAN READ 0 DUE TO SIX
                                ;*      READ MISSES
                                ;;*****************************************************************
     043252                     TST223:
7190 043252  000004                     SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                 ;ERROR/LOOP ON TEST
     043254  043264                     .WORD   40$             ;TEST START LOCATION
     043256  070010                     .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     043260  000000                     .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     043262  070046                     .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     043264  012737  001015  177746 40$: MOV     #OFF,CCR        ;DISABLE CACHE
     043272  004437  002370             JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     043276  043412                     .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                ;ARE RELOCATED TO HI CACHE SPACE

7191 043300  012700  040000             MOV     #40000,R0       ;ADDR. 40000 TO R0
7192 043304  012701  060000             MOV     #60000,R1       ;ADDR 60000 TO R1
7193 043310  112737  000002  177750 1$: MOVB    #HODO,CMR       ;HODO ALLOWS HIT REGISTER TO BE CLOCKED
7194                                                             ;ONLY DURING THE DESTINATION ACCESS
7195                                                             ;OF AN INSTRUCTION.
7196 043316  012737  000015  177746     MOV     #15,CCR         ;NO UCB SO AS TO WRITE CACHE STORES
7197 043324  005710                     TST     (R0)
7198 043326  005711                     TST     (R1)            ;READ MISS
7199 043330  005710                     TST     (R0)            ;READ MISS
7200 043332  005711                     TST     (R1)            ;READ MISS
7201 043334  005710                     TST     (R0)            ;READ MISS
7202 043336  005711                     TST     (R1)            ;READ MISS
7203 043340  005710                     TST     (R0)            ;READ MISS
7204 043342  013702  177752             MOV     CHR,R2          ;SAVE CHR CONTENTS
7205 043346  000240                 25$: NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     043350  000240                     NOP                     ;FOR  LOOP ON ERROR
7206 043352  012737  001015  177746     MOV     #OFF,CCR        ;DISABLE CACHE
7207 043360  105037  177750             CLRB    CMR             ;DISABLE MAINTENANCE MODE
7208 043364  042702  177700             BIC     #177700,R2      ;PREPARE R2 FOR CHECK
7209 043370  005702                     TST     R2              ;CHR<5:0> SHOULD HAVE BEEN ALL 0'S
7210 043372  001406                     BEQ     10$             ;PASS
7211 043374  010237  047352             MOV     R2,CHR50        ;PREPARE FOR ERROR REPORT
7212 043400  104406                     ERROR                   ;ERROR
                                                                 ;-----
     043402  043400                     .WORD   .-2
7213                                                             ;CHR<5:0> DID NOT INDICATE ALL 0'S
7214                                                             ;DUE TO SIX READ MISSES
7215 043404  047352                     CHR50                   ;PRINT CHR<5:0> RECEIVED
7216 043406  000000                     .WORD   0
7217 043410  000240                 10$: NOP                     ;END OF TEST
     043412  005237  001472             INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
7222                                    .SBTTL  TEST # 224 - BIT 05 OF HIT REG CONTAINS 1 WITH 1 HIT, 5 MISSES
                                        ;;**********************************************************************
                                        ;*TEST 224 - BIT 05 OF HIT REG CONTAINS 1 WITH 1 HIT, 5 MISSES
                                        ;*      VERIFY THAT BIT 05 OF CACHE HIT REGISTER CAN CONTAIN A 1 DUE TO
                                        ;*      ONE READ HIT FOLLOWED BY FIVE READ MISSES
                                        ;;**********************************************************************
     043416                             TST224:
7223 043416  000004                             SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                        ;ERROR/LOOP ON TEST
     043420  043430                             .WORD   40$             ;TEST START LOCATION
     043422  070010                             .WORD   1$-40$+67764    ;LOOP ON ERROR START LOCATION
     043424  000000                             .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     043426  070046                             .WORD   25$-40$+67764   ;LOOP ON ERROR END LOCATION
     043430  012737  001015  177746  40$:       MOV     #OFF,CCR        ;DISABLE CACHE
     043436  004437  002370                     JSR     R4,RELCTH       ;LOCATE TEST CODE TO HIGH CACHE SPACE
     043442  043560                             .WORD   10$+2           ;ADDRESS OF START OF NEXT TEST

                                        ;THE FOLLOWING LOCATIONS INCLUDING 10$
                                        ;ARE RELOCATED TO HI CACHE SPACE

7224 043444  012700  040000                     MOV     #40000,R0       ;ADDR. 40000 TO R0
7225 043450  012701  060000                     MOV     #60000,R1       ;ADDR 60000 TO R1
7226 043454  112737  000002  177750  1$:        MOVB    #HODO,CMR       ;HODO ALLOWS HIT REGISTER TO BE CLOCKED
7227                                                                    ;ONLY DURING THE DESTINATION ACCESS
7228                                                                    ;OF AN INSTRUCTION.
7229 043462  012737  000015  177746            MOV     #15,CCR         ;NO UCB SO AS TO WRITE CACHE STORES
7230 043470  005710                             TST     (R0)
7231 043472  005710                             TST     (R0)            ;READ HIT
7232 043474  005711                             TST     (R1)            ;READ MISS
7233 043476  005710                             TST     (R0)            ;READ MISS
7234 043500  005711                             TST     (R1)            ;READ MISS
7235 043502  005710                             TST     (R0)            ;READ MISS
7236 043504  005711                             TST     (R1)            ;READ MISS
7237 043506  013702  177752                     MOV     CHR,R2          ;SAVE CHR CONTENTS
7238 043512  000240                25$:         NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     043514  000240                             NOP                     ;FOR  LOOP ON ERROR
7239 043516  012737  001015  177746            MOV     #OFF,CCR        ;DISABLE CACHE
7240 043524  105037  177750                     CLRB    CMR             ;DISABLE MAINTENANCE MODE
7241 043530  042702  177700                     BIC     #177700,R2      ;PREPARE R2 FOR CHECK
7242 043534  022702  000040                     CMP     #40,R2          ;BIT 05 SHOULD BE 1
7243 043540  001406                             BEQ     10$             ;PASS
7244 043542  010237  047352                     MOV     R2,CHR50        ;PREPARE FOR ERROR REPORT
7245 043546  104406                             ERROR                   ;ERROR
                                                                        ;-----
     043550  043546                             .WORD   .-2
7246                                                                    ;CHR BIT 05 DID NOT READ 1 DUE
7247                                                                    ;TO ONE READ HIT AND 5 READ MISSES
7248 043552  047352                             CHR50                   ;PRINT CHR<5:0> RECEIVED
7249 043554  000000                             .WORD   0
7250 043556  000240                10$:         NOP                     ;END OF TEST
     043560  005237  001472                     INC     $TESTN          ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 225 - EXERCISE CACHE BY READING MEMORY LOCATIONS
                                ;;*****************************************************************
                                ;*TEST 225 - EXERCISE CACHE BY READING MEMORY LOCATIONS
                                ;*      THIS TEST EXERCISES CACHE BY READING MEMORY LOCATIONS FROM
                                ;*      60000 TO 77776 WITH CACHE ON. ALL 4K OF CACHE WILL HAVE BEEN
                                ;*      EXERCISED. EACH ADDRESS FROM 60000 TO 77776 IS LOADED WITH
                                ;*      DATA CORRESPONDING TO ITS OWN ADDRESS.
                                ;;*****************************************************************
     043564
7258 043564  000004             TST225: SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                ;ERROR/LOOP ON TEST
     043566  043576                     .WORD   40$            ;TEST START LOCATION
     043570  043576                     .WORD   1$             ;LOOP ON ERROR START LOCATION
     043572  000000                     .WORD   0              ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     043574  043706                     .WORD   25$            ;LOOP ON ERROR END LOCATION
     043576                         40$:
7259 043576  012700  060000         1$: MOV     #60000,R0      ;FIRST ADDRESS
7260 043602  010010                 2$: MOV     R0,(R0)        ;FILL MEMORY WITH ADDRESSES
7261 043604  005720                     TST     (R0)+          ;
7262 043606  020027  077776             CMP     R0,#77776
7263 043612  101773                     BLOS    2$
7264 043614  012700  060000             MOV     #60000,R0      ;FIRST ADDRESS
7265 043620  005037  177746             CLR     177746         ;ENABLE CACHE
7266 043624  005110                 3$: COM     (R0)           ;DOUBLE COMPLEMENT DATA AND
7267 043626  005110                     COM     (R0)           ;MAKE SURE IT IS IN THE CACHE
7268 043630  011005                     MOV     (R0),R5        ;CREATE READ HIT;STORE CACHED DATA IN R5
7269 043632  020500                     CMP     R5,R0          ;CHECK RESULTS
7270 043634  001420                     BEQ     5$             ;PASS
7271 043636  012737  001015  177746     MOV     #OFF,CCR       ;DISABLE CACHE
7272 043644  010037  047356             MOV     R0,FAILAD      ;SAVE FAILED ADDRESS
7273 043650  010037  047332             MOV     R0,EXDAT6      ;GET EXPECTED DATA
7274 043654  010537  047346             MOV     R5,RECDAT      ;GET RECEIVED DATA
7275 043660  104406                     ERROR                  ;ERROR
                                                                ;-----
     043662  043660                     .WORD   .-2
7276 043664  047356                     FAILAD                 ;PRINT FAILED ADDRESS
7277 043666  047332                     EXDAT6                 ;PRINT EXPECTED DATA
7278 043670  047346                     RECDAT                 ;PRINT RECEIVED DATA
7279 043672  000000                     .WORD   0
7280 043674  000404                     BR      25$            ;
7281 043676  005720                 5$: TST     (R0)+          ;NEXT ADDRESS
7282 043700  020027  077776             CMP     R0,#77776      ;FINISHED?
7283 043704  101747                     BLOS    3$             ;CONTINUE
7284 043706  000240                25$: NOP                    ;INSTRUCTION 'JMP 1$' PLACED HERE
     043710  000240                     NOP                    ;FOR  LOOP ON ERROR
7285 043712  000240                10$: NOP                    ;END OF TEST
     043714  005237  001472             INC     $TESTN         ;INCREMENT TEST COUNTER
```

```
                                .SBTTL  TEST # 226 - ASRB INST CAUSES CACHE BYPASS WITH READ HIT
                                ;;*****************************************************************
                                ;*TEST 226 - ASRB INST CAUSES CACHE BYPASS WITH READ HIT
                                ;*      TEST DESCRIPTION:
                                ;*      VERIFY THAT THE ASRB INSTRUCTION WILL CAUSE A CACHE BYPASS
                                ;*      UNDER A READ HIT CONDITION.
                                ;;*****************************************************************
     043720                     TST226:
7292 043720  000004                     SCPCND                  ;SCOPE CONDITIONS:GO SET UP FOR LOOP ON
                                                                 ;ERROR/LOOP ON TEST
     043722  043732                     .WORD   40$             ;TEST START LOCATION
     043724  043732                     .WORD   1$              ;LOOP ON ERROR START LOCATION
     043726  000000                     .WORD   0               ;SCOPE SYNC. NOT IMPLEMENTED FOR  THIS TEST
     043730  043762                     .WORD   25$             ;LOOP ON ERROR END LOCATION
     043732                     40$:
7293 043732  012700  060000     1$:     MOV     #60000,R0       ;SETUP TEST LOCATION ADDRESS IN R0
7294 043736  112737  000002  177750     MOVB    #2,177750       ;HODO ALLOWS READ HITS TO BE CACHED,CACHE UPDATES,AND
7295                                                             ;CLOCKING OF OUTPUT OF CACHE HIT NAND
7296                                                             ;GATE INTO CMR ONLY DURING THE DESTINATION
7297                                                             ;ACCESS OF AN INSTRUCTION.
7298 043744  012737  000011  177746     MOV     #11,177746      ;NO UCB SO AS TO WRITE CACHE STORES
7299                                                             ;ENABLE LOW CACHE FOR A READ HIT
7300 043752  005710                     TST     (R0)            ;READING LOCATION SPECIFIED BY R0
7301                                                             ;WILL ASSURE A READ HIT WHEN THE
7302                                                             ;LOCATION IS READ AGAIN
7303 043754  106210                     ASRB    (R0)            ;ASRB INSTRUCTION WILL CAUSE A BYPASS
7304                                                             ;TO OCCUR INHIBITING A READ HIT
7305                                                             ;TO LOCATION SPECIFIED BY R0.
7306                                                             ;THIS SITUATION WILL RESULT IN CMR
7307                                                             ;BIT 8 BEING A 1.
7308 043756  013701  177750             MOV     177750,R1       ;SAVE CMR CONTENTS
7309 043762  000240             25$:    NOP                     ;INSTRUCTION 'JMP 1$' PLACED HERE
     043764  000240                     NOP                     ;FOR  LOOP ON ERROR
7310 043766  105037  177750             CLRB    177750          ;DISABLE MAINT MODE
7311 043772  012737  000000  177746     MOV     #0,177746       ;TURN ON CACHE
7312 044000  032701  000400             BIT     #400,R1         ;WAS CMR BIT 8 A 1
7313 044004  001003                     BNE     10$             ;PASS
7314 044006  104406                     ERROR                   ;ERROR
                                                                 ;-----
     044010  044006                     .WORD   .-2
7315                                                             ;CACHE BYPASS DID NOT OCCUR OR
7316                                                             ;SEQUENCE ERROR
7317                                                             ;READING OUTPUT OF CACHE HIT NAND GATE
7318                                                             ;THRU CMR<8> DID NOT RESULT IN A 1
7319 044012  000000                     .WORD   0
7320 044014  000240             10$:    NOP                     ;END OF TEST
     044016  005237  001472             INC     $TESTN          ;INCREMENT TEST COUNTER
7321                                ;;*****************************************************************
7322 044022  005737  001474     ENDPAS: TST     $PASS           ;IS THIS FIRST PASS?
7323 044026  001412                     BEQ     1$              ;YES; INHIBIT ITERATIONS
7324 044030  032777  004000  136036     BIT     #BIT11,@SWR     ;IS INHIBIT ITERATIONS IMPLEMENTED
7325                                                             ;THRU SWITCH REGISTER?
7326 044036  001006                     BNE     1$              ;YES
7327 044040  005237  044164             INC     $ICNT           ;INCREMENT PASS ITERATION COUNTER
7328 044044  023737  044162  044164     CMP     $TIMES,$ICNT    ;HAVE ALL ITERATIONS BEEN COMPLETED?
7329 044052  001041                     BNE     $DOAGN          ;NO,REPEAT PROGRAM
7330 044054  005037  001472     1$:     CLR     $TESTN          ;CLEAR TEST NUMBER COUNTER
```

TEST # 226 - ASRB INST CAUSES CACHE BYPASS WITH READ HIT

```
 7331 044060  005037  044164                    CLR     $ICNT           ;CLEAR PASS ITERATION COUNTER
 7332 044064  005237  001474                    INC     $PASS           ;INCREMENT PASS COUNT
 7333 044070  042737  100000  001474            BIC     #100000,$PASS   ;DON'T ALLW A NEGATIVE #
 7334 044076  104401  044104                    TYPE    ,65$            ;;TYPE ASCIZ STRING
      044102  000410                            BR      64$             ;;GET OVER THE ASCIZ
      044104     200     105     116  65$:     .ASCIZ  <CRLF>/END OF PASS # /
                                               .EVEN
      044124                                   64$:
 7335 044124  013746  001474                    MOV     $PASS,-(SP)     ;;SAVE $PASS FOR TYPEOUT
      044130  104405                            TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
 7336 044132  104401  002122                    TYPE    ,$ENULL
 7337 044136  013700  000042                    MOV     42,R0
 7338 044142  001405                            BEQ     $DOAGN
 7339 044144  000005                            RESET
 7340 044146  004710                   $ENDAD:  JSR     PC,(R0)
 7341 044150  000240                            NOP
 7342 044152  000240                            NOP
 7343 044154  000240                            NOP
 7344 044156  000137  002416           $DOAGN:  JMP     BEGIN           ;START AGAIN
 7345
 7346 044162  000012                   $TIMES:  .WORD   10.
 7347 044164  000000                   $ICNT:   .WORD   0
```

TYPE ROUTINE

```
                                        .SBTTL  TYPE ROUTINE
                                        ;;*****************************************************************
                                        ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
                                        ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
                                        ;*NOTE1:         $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
                                        ;*NOTE2:         $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
                                        ;*NOTE3:         $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
                                        ;*
                                        ;*CALL:
                                        ;*1) USING A TRAP INSTRUCTION
                                        ;*       TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
                                        ;*OR
                                        ;*       TYPE
                                        ;*       MESADR
                                        ;*
044166  105737  002111          $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
044172  100002                         BPL     1$              ;;BR IF YES
044174  000000                         HALT                    ;;HALT HERE IF NO TERMINAL
044176  000430                         BR      3$              ;;LEAVE
044200  010046                  1$:    MOV     R0,-(SP)        ;;SAVE R0
044202  017600  000002                 MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
044206  122737  000001  001506         CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
044214  001011                         BNE     62$             ;;NO,GO CHECK FOR APT CONSOLE
044216  132737  000100  001507         BITB    #APTSPOOL,$ENVM ;;SPOOL MESSAGE TO APT
044224  001405                         BEQ     62$             ;;NO,GO CHECK FOR CONSOLE
044226  010037  044236                 MOV     R0,61$          ;;SETUP MESSAGE ADDRESS FOR APT
044232  004737  001620                 JSR     PC,$ATY3        ;;SPOOL MESSAGE TO APT
044236  000000                  61$:    .WORD   0               ;;MESSAGE ADDRESS
044240  132737  000040  001507  62$:    BITB    #APTCSUP,$ENVM  ;;APT CONSOLE SUPPRESSED
044246  001003                         BNE     60$             ;;YES,SKIP TYPE OUT
044250  112046                  2$:    MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
044252  001005                         BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
044254  005726                         TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
044256  012600                  60$:    MOV     (SP)+,R0        ;;RESTORE R0
044260  062716  000002          3$:    ADD     #2,(SP)         ;;ADJUST RETURN PC
044264  000002                         RTI                     ;;RETURN
044266  122716  000011          4$:    CMPB    #HT,(SP)        ;;BRANCH IF <HT>
044272  001430                         BEQ     8$
044274  122716  000200                 CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
044300  001006                         BNE     5$
044302  005726                         TST     (SP)+           ;;POP  <CR><LF> EQUIV
044304  104401                         TYPE                    ;;TYPE A CR AND LF
044306  002117                         $CRLF
044310  105037  044514                 CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
044314  000755                         BR      2$              ;;GET NEXT CHARACTER
044316  004737  044400          5$:    JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
044322  123726  002110          6$:    CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
044326  001350                         BNE     2$              ;;IF NO GO GET NEXT CHAR.
044330  013746  002106                 MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
                                                                ;;AND THE NULL CHAR.
044334  105366  000001          7$:    DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
044340  002770                         BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
044342  004737  044400                 JSR     PC,$TYPEC       ;;GO TYPE A NULL
044346  105337  044514                 DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
044352  000770                         BR      7$              ;;LOOP
                                        ;HORIZONTAL TAB PROCESSOR
044354  112716  000040          8$:    MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
```

```
044360  004737  044400          9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
044364  132737  000007  044514          BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
044372  001372                          BNE     9$              ;;TAB STOP
044374  005726                          TST     (SP)+           ;;POP SPACE OFF STACK
044376  000724                          BR      2$              ;;GET NEXT CHARACTER
044400  105777  135476      $TYPEC:     TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
044404  100375                          BPL     $TYPEC
044406  116677  000002  135470          MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
044414  105777  135456                  TSTB    @$TKS           ;;SEE IF KEYBOARD IS TALKING.
044420  100021                          BPL     2$              ;;BRANCH IF IT ISN'T.
044422  017746  135452                  MOV     @$TKB,-(SP)     ;;PUSH CHARACTER ONTO STACK.
044426  042716  177600                  BIC     #177600,(SP)    ;;BIT CLEAR TOP BYTE AND PARITY BIT.
044432  022726  000023                  CMP     #23,(SP)+       ;;SEE IF THIS IS A ^S.
044436  001012                          BNE     2$              ;;BRANCH TO CONTINUE IF IT ISN'T.
044440  105777  135432          3$:     TSTB    @$TKS           ;;WAIT FOR ANOTHER INPUT.
044444  100375                          BPL     3$              ;;BRANCH BACK IF NOT READY.
044446  017746  135426                  MOV     @$TKB,-(SP)     ;;PUSH NEXT CHARACTER ON STACK.
044452  042716  177600                  BIC     #177600,(SP)    ;;BIT CLEAR TOP BYTE AND PARITY BIT.
044456  022726  000021                  CMP     #21,(SP)+       ;;SEE IF THIS IS A ^Q.
044462  001366                          BNE     3$              ;;BRANCH BACK FOR MORE WAIT IF NOT.
044464  122766  000015  000002  2$:     CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
044472  001003                          BNE     1$              ;;BRANCH IF NO
044474  105037  044514                  CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
044500  000406                          BR      $TYPEX          ;;EXIT
044502  122766  000012  000002  1$:     CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
044510  001402                          BEQ     $TYPEX          ;;BRANCH IF YES
044512  105227                          INCB    (PC)+           ;;COUNT THE CHARACTER
044514  000000          $CHARCNT:.WORD  0               ;;CHARACTER COUNT STORAGE
044516  000207          $TYPEX: RTS     PC
```

```
 7350                                   .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
                                        ;;*****************************************************************
                                        ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
                                        ;*OCTAL (ASCII) NUMBER AND TYPE IT.
                                        ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
                                        ;*CALL:
                                        ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                        ;*      TYPOS                   ;;CALL FOR TYPEOUT
                                        ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
                                        ;*      .BYTE   M               ;;M=1 OR 0
                                        ;*                                      ;;1=TYPE LEADING ZEROS
                                        ;*                                      ;;0=SUPPRESS LEADING ZEROS
                                        ;*
                                        ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
                                        ;*$TYPOS OR $TYPOC
                                        ;*CALL:
                                        ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                        ;*      TYPON                   ;;CALL FOR TYPEOUT
                                        ;*
                                        ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
                                        ;*CALL:
                                        ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                        ;*      TYPOC                   ;;CALL FOR TYPEOUT
 044520  017646  000000         $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
 044524  116637  000001  044743         MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
 044532  112637  044745                 MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
 044536  062716  000002                 ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
 044542  000406                         BR      $TYPON
 044544  112737  000001  044743 $TYPOC: MOVB    #1,$OFILL       ;;SET THE ZERO FILL SWITCH
 044552  112737  000006  044745         MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
 044560  112737  000005  044742 $TYPON: MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
 044566  010346                         MOV     R3,-(SP)        ;;SAVE R3
 044570  010446                         MOV     R4,-(SP)        ;;SAVE R4
 044572  010546                         MOV     R5,-(SP)        ;;SAVE R5
 044574  113704  044745                 MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
 044600  005404                         NEG     R4
 044602  062704  000006                 ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
 044606  110437  044744                 MOVB    R4,$OMODE       ;;SAVE IT FOR USE
 044612  113704  044743                 MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
 044616  016605  000012                 MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
 044622  005003                         CLR     R3              ;;CLEAR THE OUTPUT WORD
 044624  006105                 1$:     ROL     R5              ;;ROTATE MSB INTO "C"
 044626  000404                         BR      3$              ;;GO DO MSB
 044630  006105                 2$:     ROL     R5              ;;FORM THIS DIGIT
 044632  006105                         ROL     R5
 044634  006105                         ROL     R5
 044636  010503                         MOV     R5,R3
 044640  006103                 3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
 044642  105337  044744                 DECB    $OMODE          ;;TYPE THIS DIGIT?
 044646  100016                         BPL     7$              ;;BR IF NO
 044650  042703  177770                 BIC     #177770,R3      ;;GET RID OF JUNK
 044654  001002                         BNE     4$              ;;TEST FOR 0
 044656  005704                         TST     R4              ;;SUPPRESS THIS 0?
 044660  001403                         BEQ     5$              ;;BR IF YES
 044662  005204                 4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
 044664  052703  000060                 BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
 044670  052703  000040         5$:     BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
```

```
044674  110337  044740                  MOVB    R3,8$           ;;SAVE FOR TYPING
044700  104401  044740                  TYPE    ,8$             ;;GO TYPE THIS DIGIT
044704  105337  044742          7$:     DECB    $OCNT           ;;COUNT BY 1
044710  003347                          BGT     2$              ;;BR IF MORE TO DO
044712  002402                          BLT     6$              ;;BR IF DONE
044714  005204                          INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
044716  000744                          BR      2$              ;;GO DO THE LAST DIGIT
044720  012605                  6$:     MOV     (SP)+,R5        ;;RESTORE R5
044722  012604                          MOV     (SP)+,R4        ;;RESTORE R4
044724  012603                          MOV     (SP)+,R3        ;;RESTORE R3
044726  016666  000002  000004          MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
044734  012616                          MOV     (SP)+,(SP)
044736  000002                          RTI                     ;;RETURN
044740     000                  8$:     .BYTE   0               ;;STORAGE FOR ASCII DIGIT
044741     000                          .BYTE   0               ;;TERMINATOR FOR TYPE ROUTINE
044742     000          $OCNT:  .BYTE   0               ;;OCTAL DIGIT COUNTER
044743     000          $OFILL: .BYTE   0               ;;ZERO FILL SWITCH
044744  000000          $OMODE: .WORD   0               ;;NUMBER OF DIGITS TO TYPE
```

```
   7352                                 .SBTTL  CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
                                        ;;**********************************************************************
                                        ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 5-DIGIT
                                        ;*SIGNED DECIMAL (ASCII) NUMBER AND TYPE IT. DEPENDING ON WHETHER THE
                                        ;*NUMBER IS POSITIVE OR NEGATIVE A SPACE OR A MINUS SIGN WILL BE TYPED
                                        ;*BEFORE THE FIRST DIGIT OF THE NUMBER. LEADING ZEROS WILL ALWAYS BE
                                        ;*REPLACED WITH SPACES.
                                        ;*CALL:
                                        ;*      MOV     NUM,-(SP)       ;;PUT THE BINARY NUMBER ON THE STACK
                                        ;*      TYPDS                   ;;GO TO THE ROUTINE
        044746                          $TYPDS:
        044746  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
        044750  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
        044752  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
        044754  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
        044756  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
        044760  012746  020200                  MOV     #20200,-(SP)    ;;SET BLANK SWITCH AND SIGN
        044764  016605  000020                  MOV     20(SP),R5       ;;GET THE INPUT NUMBER
        044770  100004                          BPL     1$              ;;BR IF INPUT IS POS.
        044772  005405                          NEG     R5              ;;MAKE THE BINARY NUMBER POS.
        044774  112766  000055  000001          MOVB    #'-,1(SP)       ;;MAKE THE ASCII NUMBER NEG.
        045002  005000                  1$:     CLR     R0              ;;ZERO THE CONSTANTS INDEX
        045004  012703  045162                  MOV     #$DBLK,R3       ;;SETUP THE OUTPUT POINTER
        045010  112723  000040                  MOVB    #' ,(R3)+       ;;SET THE FIRST CHARACTER TO A BLANK
        045014  005002                  2$:     CLR     R2              ;;CLEAR THE BCD NUMBER
        045016  016001  045152                  MOV     $DTBL(R0),R1    ;;GET THE CONSTANT
        045022  160105                  3$:     SUB     R1,R5           ;;FORM THIS BCD DIGIT
        045024  002402                          BLT     4$              ;;BR IF DONE
        045026  005202                          INC     R2              ;;INCREASE THE BCD DIGIT BY 1
        045030  000774                          BR      3$
        045032  060105                  4$:     ADD     R1,R5           ;;ADD BACK THE CONSTANT
        045034  005702                          TST     R2              ;;CHECK IF BCD DIGIT=0
        045036  001002                          BNE     5$              ;;FALL THROUGH IF 0
        045040  105716                          TSTB    (SP)            ;;STILL DOING LEADING 0'S?
        045042  100407                          BMI     7$              ;;BR IF YES
        045044  106316                  5$:     ASLB    (SP)            ;;MSD?
        045046  103003                          BCC     6$              ;;BR IF NO
        045050  116663  000001  177777          MOVB    1(SP),-1(R3)    ;;YES--SET THE SIGN
        045056  052702  000060          6$:     BIS     #'0,R2          ;;MAKE THE BCD DIGIT ASCII
        045062  052702  000040          7$:     BIS     #' ,R2          ;;MAKE IT A SPACE IF NOT ALREADY A DIGIT
        045066  110223                          MOVB    R2,(R3)+        ;;PUT THIS CHARACTER IN THE OUTPUT BUFFER
        045070  005720                          TST     (R0)+           ;;JUST INCREMENTING
        045072  020027  000010                  CMP     R0,#10          ;;CHECK THE TABLE INDEX
        045076  002746                          BLT     2$              ;;GO DO THE NEXT DIGIT
        045100  003002                          BGT     8$              ;;GO TO EXIT
        045102  010502                          MOV     R5,R2           ;;GET THE LSD
        045104  000764                          BR      6$              ;;GO CHANGE TO ASCII
        045106  105726                  8$:     TSTB    (SP)+           ;;WAS THE LSD THE FIRST NON-ZERO?
        045110  100003                          BPL     9$              ;;BR IF NO
        045112  116663  177777  177776          MOVB    -1(SP),-2(R3)   ;;YES--SET THE SIGN FOR TYPING
        045120  105013                  9$:     CLRB    (R3)            ;;SET THE TERMINATOR
        045122  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
        045124  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
        045126  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
        045130  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
        045132  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
        045134  104401  045162                  TYPE    ,$DBLK          ;;NOW TYPE THE NUMBER
```

CONVERT BINARY TO DECIMAL AND TYPE ROUTINE

```
045140  016666  000002  000004          MOV     2(SP),4(SP)     ;;ADJUST THE STACK
045146  012616                          MOV     (SP)+,(SP)
045150  000002                          RTI                     ;;RETURN TO USER
045152  023420                  $DTBL:  10000.
045154  001750                          1000.
045156  000144                          100.
045160  000012                          10.
045162                          $DBLK:  .BLKW   4
```

```
7354                                    .SBTTL  TRAP DECODER
                                        ;;*****************************************************************
                                        ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
                                        ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
                                        ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
                                        ;*GO TO THAT ROUTINE.
045172  010046                          $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
045174  016600  000002                          MOV     2(SP),R0        ;;GET TRAP ADDRESS
045200  005740                                  TST     -(R0)           ;;BACKUP BY 2
045202  111000                                  MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
045204  006300                                  ASL     R0              ;;POSITION FOR INDEXING
045206  016000  045226                          MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
045212  000200                                  RTS     R0              ;;GO TO ROUTINE
                                        ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO
045214  011646                          $TRAP2: MOV     (SP),-(SP)      ;;MOVE THE PC DOWN
045216  016666  000004  000002                  MOV     4(SP),2(SP)     ;;MOVE THE PSW DOWN
045224  000002                                  RTI                     ;;RESTORE THE PSW
                                        .SBTTL  TRAP TABLE
                                        ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
                                        ;*BY THE "TRAP" INSTRUCTION.
                                        ;       ROUTINE
                                        ;       -------
045226  045214                          $TRPAD: .WORD   $TRAP2
045230  044166                                  $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
045232  044544                                  $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
045234  044520                                  $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
045236  044560                                  $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
045240  044746                                  $TYPDS  ;;CALL=TYPDS    TRAP+5(104405)  TYPE DECIMAL NUMBER (WITH SIGN)
7355 045242  045246                            $ERROR  ;;CALL=ERROR    TRAP+6(104406)
```

```
                                        .SBTTL  ERROR HANDLER ROUTINE
                                ;;**************************************************************
045244  000000                  ERRPC:  .WORD   0
045246  010037  045300          $ERROR: MOV     R0,SAVR0        ;SAVE R0 THRU R5
045252  010137  045302                  MOV     R1,SAVR1
045256  010237  045304                  MOV     R2,SAVR2
045262  010337  045306                  MOV     R3,SAVR3
045266  010437  045310                  MOV     R4,SAVR4
045272  010537  045312                  MOV     R5,SAVR5
045276  000406                        BR      TITL
045300  000000          SAVR0:  .WORD
045302  000000          SAVR1:  .WORD
045304  000000          SAVR2:  .WORD
045306  000000          SAVR3:  .WORD
045310  000000          SAVR4:  .WORD
045312  000000          SAVR5:  .WORD

045314  113777  002060  134552  TITL:   MOVB    $TSTNM,@SWR     ;MOVE TEST NUMBER TO DISPLAY FOR ALL TO SEE
045322  032777  020000  134544          BIT     #BIT13,@SWR     ;INHIBIT ERROR TYPEOUTS?
045330  001113                  BNE     INHERR          ;YES
045332  011601                  MOV     (SP),R1         ;R1 CONTAINS ADDRESS FOLLOWING ERRPC ADDRESS
045334  012137  045244          MOV     (R1)+,ERRPC     ;LOAD ERRPC ADDRESS AND POINT
                                                        ;TO NEXT ARGUEMENT
045340  104401  045346          TYPE    ,65$            ;;TYPE ASCIZ STRING
045344  000411                  BR      64$             ;;GET OVER THE ASCIZ
045346    200     200     124   65$:    .ASCIZ  <CRLF><CRLF>/TESTNO    ERRPC/
                                        .EVEN
045370                          64$:
045370  005711          3$:     TST     (R1)            ;END OF ARGUEMENTS?
045372  001412                  BEQ     DAT             ;YES,GO PRINT DATA
045374  012702  047246          MOV     #PRTABL,R2      ;ADDRESS OF START OF PRINT TABLE LIST
045400  012703  045752          MOV     #PRTITL,R3      ;ADDRESS OF START OF TITLES
045404  005723          2$:     TST     (R3)+           ;INDEX THRU TITLES
045406  021122                  CMP     (R1),(R2)+      ;SEARCH PRINT TABLE LIST FOR TITLE
045410  001375                  BNE     2$              ;NO; CHECK NEXT LOCATION IN LIST
045412  004753                  JSR     PC,@-(R3)       ;FOUND IT; GO PRINT TITLE
045414  005721                  TST     (R1)+           ;R1 POINTS TO NXT ARGUEMENT IN TEST CODE
045416  000764                  BR      3$
045420                  DAT:
045420  104401  045426          TYPE    ,65$            ;;TYPE ASCIZ STRING
045424  000401                  BR      64$             ;;GET OVER THE ASCIZ
045426    200     000   65$:    .ASCIZ  <CRLF>
                                        .EVEN
045430                          64$:
045430  013746  001472          MOV     $TESTN,-(SP)    ;;SAVE $TESTN FOR TYPEOUT
045434  104403                  TYPOS                   ;;GO TYPE--OCTAL ASCII
045436    006                   .BYTE   6               ;;TYPE 6 DIGIT(S)
045437    000                   .BYTE   0               ;;SUPPRESS LEADING ZEROS
045440  104401  045446          TYPE    ,67$            ;;TYPE ASCIZ STRING
045444  000402                  BR      66$             ;;GET OVER THE ASCIZ
045446    040     040     000   67$:    .ASCIZ  /  /
                                        .EVEN
045452                          66$:
045452  013746  045244          MOV     ERRPC,-(SP)     ;;SAVE ERRPC FOR TYPEOUT
045456  104402                  TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
045460  104401  002122          TYPE    ,$ENULL
045464  011601                  MOV     (SP),R1         ;R1 CONTAINS ADDRESS FOLLOWING ERRORPC ADDRESS
```

```
7397 045466  005721                        TST     (R1)+           ;POINT TO NEXT ARGUEMENT
7398 045470  005711                3$:     TST     (R1)            ;END OF ARGUEMENTS?
7399 045472  001437                        BEQ     FIN             ;YES
7400 045474  012702  047246               MOV     #PRTABL,R2      ;ADDRESS OF START OF PRINT TABLE LIST
7401 045500  012703  046724               MOV     #PRDATA,R3      ;ADDRESS OF STERT OF PRINT DATA
7402 045504  005723                2$:     TST     (R3)+           ;INDEX THRU DATA PRINTS
7403 045506  021122                        CMP     (R1),(R2)+      ;SEARCH PRINT TABLE LIST FOR TITLE
7404 045510  001375                        BNE     2$              ;NO; CHECK NEXT LOCATION IN LIST
7405 045512  104401  045520               TYPE    ,69$            ;;TYPE ASCIZ STRING
     045516  000404                        BR      68$             ;;GET OVER THE ASCIZ
     045520    040    040    040  69$:     .ASCIZ  /      /
                                           .EVEN
     045530                             68$:
7406 045530  004753                        JSR     PC,@-(R3)       ;
7407 045532  104401  002122               TYPE    ,$ENULL
7408 045536  104401  045544               TYPE    ,71$            ;;TYPE ASCIZ STRING
     045542  000404                        BR      70$             ;;GET OVER THE ASCIZ
     045544    040    040    040  71$:     .ASCIZ  /      /
                                           .EVEN
     045554                             70$:
7409 045554  005721                        TST     (R1)+           ;R1 POINTS TO NEXT ARGUEMENT
7410 045556  000744                        BR      3$
7411                                       ;INHIBIT ERROR TYPEOUT CODE
7412
7413 045560  011601                INHERR: MOV (SP),R1             ;R1 CONTAINS ADDRESS FOLLOWING ERRPC ADDRESS
7414 045562  005711                1$:     TST     (R1)            ;IS THIS THE END OF ARGUEMENT LIST?
7415 045564  001402                        BEQ     FIN             ;YES
7416 045566  005721                        TST     (R1)+           ;POINT TO NEXT ARGUEMENT
7417 045570  000774                        BR      1$
7418 045572  005721                FIN:    TST     (R1)+           ;R1 NOW CONTAINS RETURN ADDRESS
7419 045574  010116                        MOV     R1,(SP)         ;SETUP RETURN ADDRESS IN STACK
7420
7421                                       ;HOE,LOE OPTION DETERMINATION
7422
7423 045576  122737  000001  001506        CMPB    #APTENV,$ENV    ;IS THIS APT?
7424 045604  001410                        BEQ     2$              ;YES HALT ON ERROR
7425 045606  023737  000042  000046        CMP     42,46           ;IS THIS ACT11 QV OR AUTO ACCEPT
7426 045614  001404                        BEQ     2$              ;YES HALT ON ERROR
7427 045616  032777  100000  134250        BIT     #BIT15,@SWR     ;IS HALT ON ERROR IMPLEMENTED?
7428 045624  001404                        BEQ     1$              ;NO
7429 045626  012737  000001  001466  2$:   MOV     #1,$MSGTY       ;SET $MSGTY FOR POSSIBLE APT USE
7430 045634  000000                        HALT                    ;YES ,HALT PROCESSOR
7431 045636  032777  001000  134230  1$:   BIT     #BIT09,@SWR     ;IS LOOP ON ERROR IMPLEMENTED?
7432 045644  001010                        BNE     4$              ;YES
7433                                                               ;NO;INITIALIZE LOCATIONS WHERE
7434                                                               ;'JMP 1$' IS PLACED FOR LOOP ON ERROR
7435                                                               ;WITH NOP'S
7436 045646  012777  000240  134260        MOV     #240,@ADRJMP
7437 045654  012777  000240  134254        MOV     #240,@ADR1$
7438 045662  000137  045720                JMP     5$              ;CONTINUE WITH PRESENT TEST
7439 045666  012777  000137  134240  4$:   MOV     #137,@ADRJMP    ;WRITE 'JMP' INSTRUCTION TO PROPER ADDRESS
7440 045674  013777  002130  134234        MOV     STRTLP,@ADR1$   ;WRITE '1$' LOCATION TO PROPER ADDRESS
7441 045702  013737  002132  177752        MOV     ADRSYNC,CHR     ;LOAD ADDRESS LOCATION FOR SCOPE SYNC
7442 045710  105037  177751                CLRB    CMR+1
7443 045714  013716  002130                MOV     STRTLP,(SP)     ;SETUP LOCATION FOR LOOP ON ERROR IN STACK
7444 045720  013700  045300          5$:   MOV     SAVR0,R0        ;RESTORE REGISTERS
7445 045724  013701  045302                MOV     SAVR1,R1
```

```
   7446 045730  013702  045304          MOV     SAVR2,R2
   7447 045734  013703  045306          MOV     SAVR3,R3
   7448 045740  013704  045310          MOV     SAVR4,R4
   7449 045744  013705  045312          MOV     SAVR5,R5
   7450 045750  000002                  RTI                     ;RETURN
```

```
ERROR HANDLER ROUTINE
   7451 045752  046014  046050  046104  PRTITL: .WORD   1$,2$,3$,4$,5$,6$,7$,8$,9$,10$,11$,12$,13$,14$,15$,16$,17$
   7452 046014                          1$:
        046014  104401  046022                  TYPE    ,65$             ;;TYPE ASCIZ STRING
        046020  000412                          BR      64$              ;;GET OVER THE ASCIZ
        046022    040     040     040   65$:    .ASCIZ  /    CA210(21:0)    /
                                                .EVEN
        046046                          64$:
   7453 046046  000207                          RTS PC
   7454 046050                          2$:
        046050  104401  046056                  TYPE    ,67$             ;;TYPE ASCIZ STRING
        046054  000412                          BR      66$              ;;GET OVER THE ASCIZ
        046056    040     040     040   67$:    .ASCIZ  /    AMR210(21:0)   /
                                                .EVEN
        046102                          66$:
   7455 046102  000207                          RTS PC
   7456 046104                          3$:
        046104  104401  046112                  TYPE    ,69$             ;;TYPE ASCIZ STRING
        046110  000412                          BR      68$              ;;GET OVER THE ASCIZ
        046112    040     040     040   69$:    .ASCIZ  /   CHR157(15:07)   /
                                                .EVEN
        046136                          68$:
   7457 046136  000207                          RTS PC
   7458 046140                          4$:
        046140  104401  046146                  TYPE    ,71$             ;;TYPE ASCIZ STRING
        046144  000412                          BR      70$              ;;GET OVER THE ASCIZ
        046146    040     040     040   71$:    .ASCIZ  /   CA2113(21:13)   /
                                                .EVEN
        046172                          70$:
   7459 046172  000207                          RTS PC
   7460 046174                          5$:
        046174  104401  046202                  TYPE    ,73$             ;;TYPE ASCIZ STRING
        046200  000412                          BR      72$              ;;GET OVER THE ASCIZ
        046202    040     040     040   73$:    .ASCIZ  /     CHR80(8:0)    /
                                                .EVEN
        046226                          72$:
   7461 046226  000207                          RTS PC
   7462 046230                          6$:
        046230  104401  046236                  TYPE    ,75$             ;;TYPE ASCIZ STRING
        046234  000412                          BR      74$              ;;GET OVER THE ASCIZ
        046236    040     040     040   75$:    .ASCIZ  /   CDR150(15:0)   /
                                                .EVEN
        046262                          74$:
   7463 046262  000207                          RTS PC
   7464 046264                          7$:
        046264  104401  046272                  TYPE    ,77$             ;;TYPE ASCIZ STRING
        046270  000412                          BR      76$              ;;GET OVER THE ASCIZ
        046272    040     040     040   77$:    .ASCIZ  /      EXDAT6      /
                                                .EVEN
        046316                          76$:
   7465 046316  000207                          RTS PC
   7466 046320                          8$:
        046320  104401  046326                  TYPE    ,79$             ;;TYPE ASCIZ STRING
        046324  000412                          BR      78$              ;;GET OVER THE ASCIZ
        046326    040     040     040   79$:    .ASCIZ  /    CA121(12:1)    /
                                                .EVEN
        046352                          78$:
   7467 046352  000207                          RTS PC
```

```
                                        9$:
7468 046354
     046354  104401  046362                    TYPE    ,81$             ;;TYPE ASCIZ STRING
     046360  000412                            BR      80$              ;;GET OVER THE ASCIZ
     046362    040     040     040   81$:      .ASCIZ  /      EXDAT1      /
                                               .EVEN
     046406                                    80$:
7469 046406  000207                            RTS PC
7470 046410                                    10$:
     046410  104401  046416                    TYPE    ,83$             ;;TYPE ASCIZ STRING
     046414  000412                            BR      82$              ;;GET OVER THE ASCIZ
     046416    040     040     040   83$:      .ASCIZ  /   CM1513(15:13)  /
                                               .EVEN
     046442                                    82$:
7471 046442  000207                            RTS PC
7472 046444                                    11$:
     046444  104401  046452                    TYPE    ,85$             ;;TYPE ASCIZ STRING
     046450  000412                            BR      84$              ;;GET OVER THE ASCIZ
     046452    040     040     040   85$:      .ASCIZ  /    CNT121(12:1)   /
                                               .EVEN
     046476                                    84$:
7473 046476  000207                            RTS PC
7474 046500                                    12$:
     046500  104401  046506                    TYPE    ,87$             ;;TYPE ASCIZ STRING
     046504  000412                            BR      86$              ;;GET OVER THE ASCIZ
     046506    040     040     040   87$:      .ASCIZ  /      FLTPAT      /
                                               .EVEN
     046532                                    86$:
7475 046532  000207                            RTS PC
7476 046534                                    13$:
     046534  104401  046542                    TYPE    ,89$             ;;TYPE ASCIZ STRING
     046540  000406                            BR      88$              ;;GET OVER THE ASCIZ
     046542    011     122     105   89$:      .ASCIZ  /      RECDAT      /
                                               .EVEN
     046556                                    88$:
7477 046556  000207                            RTS PC
7478 046560                                    14$:
     046560  104401  046566                    TYPE    ,91$             ;;TYPE ASCIZ STRING
     046564  000411                            BR      90$              ;;GET OVER THE ASCIZ
     046566    040     040     040   91$:      .ASCIZ  /      EXDAT3      /
                                               .EVEN
     046610                                    90$:
7479 046610  000207                            RTS PC
7480 046612                                    15$:
     046612  104401  046620                    TYPE    ,93$             ;;TYPE ASCIZ STRING
     046616  000407                            BR      92$              ;;GET OVER THE ASCIZ
     046620    011     103     110   93$:      .ASCIZ  /      CHR50       /
                                               .EVEN
     046636                                    92$:
7481 046636  000207                            RTS PC
7482 046640                                    16$:
     046640  104401  046646                    TYPE    ,95$             ;;TYPE ASCIZ STRING
     046644  000411                            BR      94$              ;;GET OVER THE ASCIZ
     046646    040     040     040   95$:      .ASCIZ  /     CMR119       /
                                               .EVEN
     046670                                    94$:
7483 046670  000207                            RTS PC
7484 046672                                    17$:
```

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        046672  104401  046700                  TYPE    ,97$            ;;TYPE ASCIZ STRING
        046676  000411                          BR      96$             ;;GET OVER THE ASCIZ
        046700     040     040     040  97$:    .ASCIZ  /    FAILAD      /
                                                .EVEN
        046722                          96$:
   7485 046722  000207                          RTS PC
```

```
ERROR HANDLER ROUTINE
   7486 046724  046766  047010  047032  PRDATA: .WORD   1$,2$,3$,4$,5$,6$,7$,8$,9$,10$,11$,12$,13$,14$,15$,16$,17$
   7487 046766                          1$:
        046766  013746  047312                 MOV     CA210,-(SP)     ;;SAVE CA210 FOR TYPEOUT
        046772  104403                         TYPOS                   ;;GO TYPE--OCTAL ASCII
        046774     003                         .BYTE   3               ;;TYPE 3 DIGIT(S)
        046775     001                         .BYTE   1               ;;TYPE LEADING ZEROS
   7488 046776  013746  047314                 MOV     CA210+2,-(SP)   ;;SAVE CA210+2 FOR TYPEOUT
        047002  104403                         TYPOS                   ;;GO TYPE--OCTAL ASCII
        047004     005                         .BYTE   5               ;;TYPE 5 DIGIT(S)
        047005     001                         .BYTE   1               ;;TYPE LEADING ZEROS
   7489 047006  000207                         RTS PC
   7490 047010                          2$:
        047010  013746  047316                 MOV     AMR210,-(SP)    ;;SAVE AMR210 FOR TYPEOUT
        047014  104403                         TYPOS                   ;;GO TYPE--OCTAL ASCII
        047016     003                         .BYTE   3               ;;TYPE 3 DIGIT(S)
        047017     001                         .BYTE   1               ;;TYPE LEADING ZEROS
   7491 047020  013746  047320                 MOV     AMR210+2,-(SP)  ;;SAVE AMR210+2 FOR TYPEOUT
        047024  104403                         TYPOS                   ;;GO TYPE--OCTAL ASCII
        047026     005                         .BYTE   5               ;;TYPE 5 DIGIT(S)
        047027     001                         .BYTE   1               ;;TYPE LEADING ZEROS
   7492 047030  000207                         RTS PC
   7493 047032                          3$:
        047032  013746  047322                 MOV     CHR157,-(SP)    ;;SAVE CHR157 FOR TYPEOUT
        047036  104403                         TYPOS                   ;;GO TYPE--OCTAL ASCII
        047040     003                         .BYTE   3               ;;TYPE 3 DIGIT(S)
        047041     001                         .BYTE   1               .;TYPE LEADING ZEROS
   7494 047042  000207                         RTS PC
   7495 047044                          4$:
        047044  013746  047324                 MOV     CA2113,-(SP)    ;;SAVE CA2113 FOR TYPEOUT
        047050  104403                         TYPOS                   ;;GO TYPE--OCTAL ASCII
        047052     003                         .BYTE   3               ;;TYPE 3 DIGIT(S)
        047053     001                         .BYTE   1               ;;TYPE LEADING ZEROS
   7496 047054  000207                         RTS PC
   7497 047056                          5$:
        047056  013746  047326                 MOV     CHR80,-(SP)     ;;SAVE CHR80 FOR TYPEOUT
        047062  104403                         TYPOS                   ;;GO TYPE--OCTAL ASCII
        047064     003                         .BYTE   3               ;;TYPE 3 DIGIT(S)
        047065     001                         .BYTE   1               ;;TYPE LEADING ZEROS
   7498 047066  000207                         RTS PC
   7499 047070                          6$:
        047070  013746  047330                 MOV     CDR150,-(SP)    ;;SAVE CDR150 FOR TYPEOUT
        047074  104402                         TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
   7500 047076  000207                         RTS PC
   7501 047100                          7$:
        047100  013746  047332                 MOV     EXDAT6,-(SP)    ;;SAVE EXDAT6 FOR TYPEOUT
        047104  104402                         TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
   7502 047106  000207                         RTS PC
   7503 047110                          8$:
        047110  013746  047334                 MOV     CA121,-(SP)     ;;SAVE CA121 FOR TYPEOUT
        047114  104403                         TYPOS                   ;;GO TYPE--OCTAL ASCII
        047116     004                         .BYTE   4               ;;TYPE 4 DIGIT(S)
        047117     001                         .BYTE   1               ;;TYPE LEADING ZEROS
   7504 047120  000207                         RTS PC
   7505 047122                          9$:
        047122  013746  047336                 MOV     EXDAT1,-(SP)    ;;SAVE EXDAT1 FOR TYPEOUT
        047126  104403                         TYPOS                   ;;GO TYPE--OCTAL ASCII
        047130     001                         .BYTE   1               ;;TYPE 1 DIGIT(S)
```

```
        047131     001                          .BYTE   1               ;;TYPE LEADING ZEROS
 7506   047132  000207                          RTS PC
 7507   047134                          10$:
        047134  013746  047340                  MOV     CM1513,-(SP)    ;;SAVE CM1513 FOR TYPEOUT
        047140  104403                          TYPOS                   ;;GO TYPE--OCTAL ASCII
        047142     001                          .BYTE   1               ;;TYPE 1 DIGIT(S)
        047143     001                          .BYTE   1               ;;TYPE LEADING ZEROS
 7508   047144  000207                          RTS PC
 7509   047146                          11$:
        047146  013746  047342                  MOV     CNT121,-(SP)    ;;SAVE CNT121 FOR TYPEOUT
        047152  104403                          TYPOS                   ;;GO TYPE--OCTAL ASCII
        047154     004                          .BYTE   4               ;;TYPE 4 DIGIT(S)
        047155     001                          .BYTE   1               ;;TYPE LEADING ZEROS
 7510   047156  000207                          RTS PC
 7511   047160                          12$:
        047160  013746  047344                  MOV     FLTPAT,-(SP)    ;;SAVE FLTPAT FOR TYPEOUT
        047164  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
 7512   047166  000207                          RTS PC
 7513   047170                          13$:
        047170  013746  047346                  MOV     RECDAT,-(SP)    ;;SAVE RECDAT FOR TYPEOUT
        047174  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
 7514   047176  000207                          RTS PC
 7515   047200                          14$:
        047200  013746  047350                  MOV     EXDAT3,-(SP)    ;;SAVE EXDAT3 FOR TYPEOUT
        047204  104403                          TYPOS                   ;;GO TYPE--OCTAL ASCII
        047206     003                          .BYTE   3               ;;TYPE 3 DIGIT(S)
        047207     001                          .BYTE   1               ;;TYPE LEADING ZEROS
 7516   047210  000207                          RTS PC
 7517   047212                          15$:
        047212  013746  047352                  MOV     CHR50,-(SP)     ;;SAVE CHR50 FOR TYPEOUT
        047216  104403                          TYPOS                   ;;GO TYPE--OCTAL ASCII
        047220     002                          .BYTE   2               ;;TYPE 2 DIGIT(S)
        047221     001                          .BYTE   1               ;;TYPE LEADING ZEROS
 7518   047222  000207                          RTS PC
 7519   047224                          16$:
        047224  013746  047354                  MOV     CMR119,-(SP)    ;;SAVE CMR119 FOR TYPEOUT
        047230  104403                          TYPOS                   ;;GO TYPE--OCTAL ASCII
        047232     001                          .BYTE   1               ;;TYPE 1 DIGIT(S)
        047233     001                          .BYTE   1               ;;TYPE LEADING ZEROS
 7520   047234  000207                          RTS PC
 7521   047236                          17$:
        047236  013746  047356                  MOV     FAILAD,-(SP)    ;;SAVE FAILAD FOR TYPEOUT
        047242  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
 7522   047244  000207                          RTS PC
```

```
7523 047246  047312  000000  047316  PRTABL: .WORD   CA210,,AMR210,CHR157,CA2113,CHR80,CDR150,EXDAT6,CA121,EXDAT1
7524 047272  047340  047342  047344          .WORD   CM1513,CNT121,FLTPAT,RECDAT,EXDAT3,CHR50,CMR119,FAILAD
7525
7526 047312  000000  000000          CA210:  .WORD   0,0
7527 047316  000000  000000          AMR210: .WORD   0,0
7528 047322  000000                  CHR157: .WORD   0
7529 047324  000000                  CA2113: .WORD   0
7530 047326  000000                  CHR80:  .WORD   0
7531 047330  000000                  CDR150: .WORD   0
7532 047332  000000                  EXDAT6: .WORD   0
7533 047334  000000                  CA121:  .WORD   0
7534 047336  000000                  EXDAT1: .WORD   0
7535 047340  000000                  CM1513: .WORD   0
7536 047342  000000                  CNT121: .WORD   0
7537 047344  000000                  FLTPAT: .WORD   0
7538 047346  000000                  RECDAT: .WORD   0
7539 047350  000000                  EXDAT3: .WORD   0
7540 047352  000000                  CHR50:  .WORD   0
7541 047354  000000                  CMR119: .WORD   0
7542 047356  000000                  FAILAD: .WORD   0
7543                                 ;;*****************************************************************
7544         060000                          .=60000
7545 060000  000000          LOW1:           .WORD 0
7546         070000                          .=70000
7547 070000  000000          HIGH1:          .WORD 0
7548         000001                          .END
```

SYMBOL TABLE

```
ABASE = 000000          BEBA  = 170004          FAIL1  002070          SWR     002074          TST151  026460
ACDW1 = 000000          BECC  = 170002          FAIL2  002072          SWREG   000176          TST152  027054
ACDW2 = 000000          BECR1 = 170006          FC     = 000400          TDAR  = 000001          TST153  027216
ACPUOP= 000000          BECR2 = 170016          FIN    045572          TITL    045314          TST154  027410
ADDW0 = 000000          BEDA  = 170000          FLTPAT 047344          TPB   = 001000          TST155  027574
ADDW1 = 000000          BEGIN   002416          FMHI   = 000010          TPE   = 000040          TST156  027754
ADDW10= 000000          BIT00 = 000001          FMLO   = 000004          TSTCNT  002140          TST157  030102
ADDW11= 000000          BIT01 = 000002          HIGH1  070000          TSTID = 000001          TST16   003734
ADDW12= 000000          BIT02 = 000004          HIT    = 000400          TSTIMS  002142          TST160  030256
ADDW13= 000000          BIT03 = 000010          HODO   = 000002          TST1    002514          TST161  030422
ADDW14= 000000          BIT04 = 000020          HPB    = 004000          TST10   003302          TST162  030652
ADDW15= 000000          BIT05 = 000040          HT     = 000011          TST100  012646          TST163  031102
ADDW2 = 000000          BIT06 = 000100          INHERR 045560          TST101  013072          TST164  031336
ADDW3 = 000000          BIT07 = 000200          KPAR0  = 172340          TST102  013254          TST165  031572
ADDW4 = 000000          BIT08 = 000400          KPAR1  = 172342          TST103  013572          TST166  032046
ADDW5 = 000000          BIT09 = 001000          KPAR2  = 172344          TST104  014350          TST167  032252
ADDW6 = 000000          BIT10 = 002000          KPAR3  = 172346          TST105  014562          TST17   004004
ADDW7 = 000000          BIT11 = 004000          KPAR4  = 172350          TST106  014714          TST170  032354
ADDW8 = 000000          BIT12 = 010000          KPAR5  = 172352          TST107  015052          TST171  032554
ADDW9 = 000000          BIT13 = 020000          KPAR6  = 172354          TST11   003344          TST172  033112
ADEVCT= 000000          BIT14 = 040000          KPAR7  = 172356          TST110  015236          TST173  033450
ADEVM = 000000          BIT15 = 100000          KPDR0  = 172300          TST111  015434          TST174  033740
ADRJMP  002134          CA121   047334          KPDR1  = 172302          TST112  015634          TST175  034230
ADRSYN  002132          CA210   047312          KPDR2  = 172304          TST113  016032          TST176  034606
ADR1$   002136          CA2113  047324          KPDR3  = 172306          TST114  016232          TST177  035240
AENV  = 000000          CCR   = 177746          KPDR4  = 172310          TST115  016454          TST2    002610
AENVM = 000000          CDR   = 177754          KPDR5  = 172312          TST116  016650          TST20   004054
AFATAL= 000000          CDR150  047330          KPDR6  = 172314          TST117  017242          TST200  035672
AM    = 000010          CHR   = 177752          KPDR7  = 172316          TST12   003424          TST201  036226
AMADR1= 000000          CHRPAT  002066          LF     = 000012          TST120  017336          TST202  036562
AMADR2= 000000          CHR157  047322          LOOP     002062          TST121  017414          TST203  037116
AMADR3= 000000          CHR50   047352          LOW1     060000          TST122  017522          TST204  037452
AMADR4= 000000          CHR80   047326          LPB    = 002000          TST123  017630          TST205  037574
AMAMS1= 000000          CME   = 177744          MAGPRE   007012          TST124  020046          TST206  037716
AMAMS2= 000000          CMPE  = 100000          OFF    = 001015          TST125  020250          TST207  040040
AMAMS3= 000000          CMR   = 177750          PEA    = 000200          TST126  020466          TST21   004134
AMAMS4= 000000          CMRPAT  002064          PEHI   = 000200          TST127  020670          TST210  040224
AMR210  047316          CMR119  047354          PELO   = 000100          TST13   003520          TST211  040410
AMSGAD= 000000          CM1   = 100000          PRDATA   046724          TST130  021136          TST212  040532
AMSGLG= 000000          CM1513  047340          PRTABL   047246          TST131  021414          TST213  040662
AMSGTY= 000000          CM2   = 040000          PRTITL   045752          TST132  021672          TST214  041030
AMTYP1= 000000          CM3   = 020000          PSW    = 177776          TST133  022110          TST215  041242
AMTYP2= 000000          CNT121  047342          RECDAT   047346          TST134  022312          TST216  041360
AMTYP3= 000000          CR    = 000015          RELCTH   002370          TST135  022530          TST217  041476
AMTYP4= 000000          CRLF  = 000200          RELCTL   002342          TST136  022732          TST22   004200
APASS = 000000          DAT     045420          SAVR0    045300          TST137  023200          TST220  041760
APRIOR= 000000          DCPI  = 000001          SAVR1    045302          TST14   003570          TST221  042126
APTCSU= 000040          DISPRE  000174          SAVR2    045304          TST140  023456          TST222  042656
APTENV= 000001          EHA   = 000004          SAVR3    045306          TST141  023734          TST223  043252
APTSIZ= 000200          ENDPAS  044022          SAVR4    045310          TST142  024160          TST224  043416
APTSPO= 000100          ERROR = 104406          SAVR5    045312          TST143  024370          TST225  043564
ASWREG= 000000          ERRPC   045244          SCPCND=  000004          TST144  024570          TST226  043720
ATESTN= 000000          ESA   = 000020          SR0    = 177572          TST145  025042          TST23   004250
AUNIT = 000000          EXDAT1  047336          SR3    = 172516          TST146  025224          TST24   004320
AUSWR = 000000          EXDAT3  047350          START    001000          TST147  025544          TST25   004370
AVECT1= 000000          EXDAT6  047332          STRTLP   002130          TST15   003664          TST26   004440
AVECT2= 000000          FAILAD  047356          STRTST   002126          TST150  026064          TST27   004510
```

SYMBOL TABLE

```
TST3    002704          TST67   010116          $ATY3   001620          $ERROR  045246          $PASS   001474
TST30   004560          TST7    003240          $ATY4   001630          $ETABL  001506          $PASTM  001460
TST31   004630          TST70   010474          $BASE   001542          $ETEND  001612          $QUES   002116
TST32   004700          TST71   010642          $BELL   002112          $FATAL  001470          $SCPSE  002144
TST33   004750          TST72   011172          $CDW1   001546          $FFLG   002056          $SWR  = 160000
TST34   005020          TST73   011360          $CDW2   001550          $FILLC  002110          $SWREG  001510
TST35   005070          TST74   011552          $CHARC  044514          $FILLS  002107          $TESTN  001472
TST36   005140          TST75   011762          $CPUOP  001514          $HD   = 000003          $TIMES  044162
TST37   005210          TST76   012202          $CRLF   002117          $HIBTS  001452          $TKB    002100
TST4    003000          TST77   012426          $DBLK   045162          $ICNT   044164          $TKS    002076
TST40   005260          TYPDS = 104405          $DDW0   001552          $LF     002120          $TN   = 000227
TST41   005330          TYPE  = 104401          $DDW1   001554          $LFLG   002055          $TPB    002104
TST42   005400          TYPOC = 104402          $DDW10  001576          $MADR1  001520          $TPFLG  002111
TST43   005450          TYPON = 104404          $DDW11  001600          $MADR2  001524          $TPS    002102
TST44   005520          TYPOS = 104403          $DDW12  001602          $MADR3  001530          $TRAP   045172
TST45   005570          UCB   = 001000          $DDW13  001604          $MADR4  001534          $TRAP2  045214
TST46   005640          UMPR00= 170200          $DDW14  001606          $MAIL   001466          $TRP  = 000007
TST47   005710          UMPR01= 170202          $DDW15  001610          $MAMS1  001516          $TRPAD  045226
TST5    003074          UMPR02= 170204          $DDW2   001556          $MAMS2  001522          $TSTM   001456
TST50   005766          UMPR03= 170206          $DDW3   001560          $MAMS3  001526          $TSTNM  002060
TST51   006044          UMPR04= 170210          $DDW4   001562          $MAMS4  001532          $TYPDS  044746
TST52   006122          UMPR05= 170212          $DDW5   001564          $MBADR  001454          $TYPE   044166
TST53   006200          UMPR06= 170214          $DDW6   001566          $MFLG   002054          $TYPEC  044400
TST54   006256          UMPR07= 170216          $DDW7   001570          $MSGAD  001502          $TYPEX  044516
TST55   006334          UMPR08= 170220          $DDW8   001572          $MSGLG  001504          $TYPOC  044544
TST56   006424          UMPR09= 170222          $DDW9   001574          $MSGTY  001466          $TYPON  044560
TST57   006522          VCIP  = 010000          $DEVCT  001476          $MTYP1  001517          $TYPOS  044520
TST6    003170          VLD   = 010000          $DEVM   001544          $MTYP2  001523          $UNIT   001500
TST60   006572          VSIU  = 020000          $DOAGN  044156          $MTYP3  001527          $UNITM  001462
TST61   006642          WWPD  = 000100          $DTBL   045152          $MTYP4  001533          $USWR   001512
TST62   006712          WWPT  = 002000          $ENDAD  044146          $NULL   002106          $VECT1  001536
TST63   007206          $APTHD  001452          $ENULL  002122          $NWTST= 000001          $VECT2  001540
TST64   007274          $ATYC   001636          $ENV    001506          $OCNT   044742          $OFILL  044743
TST65   007472          $ATY1   001612          $ENVM   001507          $OMODE  044744          .$X   = 001452
TST66   007652

. ABS.  070002      000
        000000      001
ERRORS DETECTED:  0


VIRTUAL MEMORY USED:  31152 WORDS  ( 122 PAGES)
DYNAMIC MEMORY:  20346 WORDS  ( 78 PAGES)
ELAPSED TIME:  00:20:09
CKKKAB.BIN,CKKKAB.SEQ/-SP/NL:TOC=CKKKAB.MLB/ML,CKKKAB.P11
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