DH11

DH11 MEMORY TEST
CZDHBC0

AH-FG21C-MC
1 OF 1 OCT 1985
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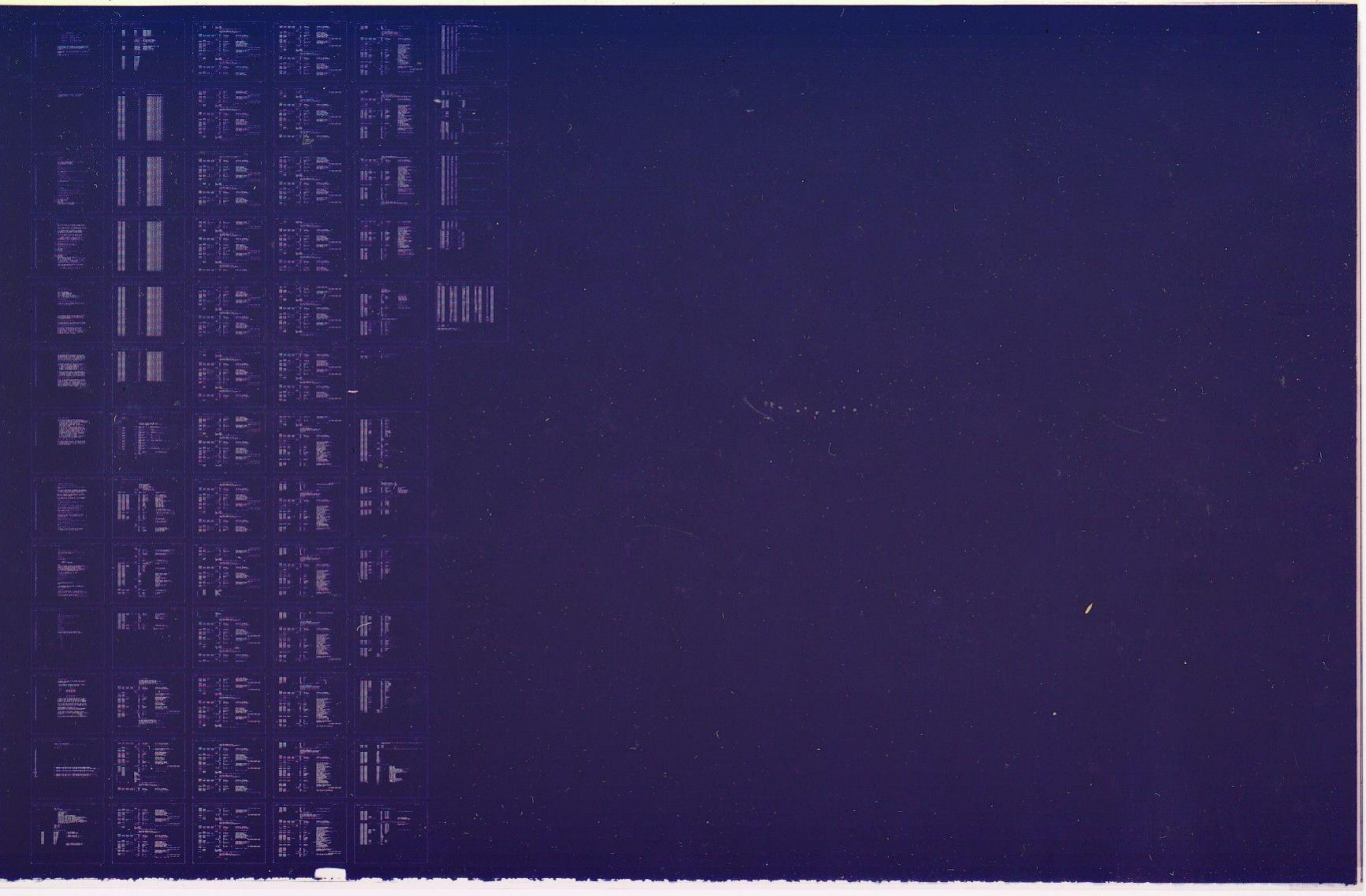

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                .REM *


                        IDENTIFICATION
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                PRODUCT CODE:   AC-8448C-MC

                PRODUCT NAME:   CZDHBCO DH11 MEMORY TEST

                DATE:           12-JUN-1985

                MAINTAINER:     NAC SOFTW*RE ENGINEERING

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2                                   1.      ABSTRACT
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4                                           THE DH11 MEMORY TEST IS A TEST OF THE BYTE COUNT AND
5                                           BUS ADDRESS MEMORIE  OF THE DH11.  EACH MEMORY IS
6                                           TESTED FOR ADDRESSAL TITY AND DATA READ/WRITE
7                                           CAPABILITY
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                2.      REQUIREMENTS

                2.1     EQUIPMENT

                        PDP-11 FAMILY STANDARD COMPUTER WITH 4KW OF MEMORY
                        ASR-33 TELETYPE OR EQUIVALENT
                        DH11 ASYNCHRONOUS MULTIPLEXER
                        DM11 MAINTENANCE CARD INSTALLED

                2.2     STORAGE

                        THE PROGRAM LOADS INTO 4KW OF MEMORY

                3.      LOADING PROCEDURE

                        THE STANDART PROCEDURE FOR LOADING ABSOLUTE BINARY TAPES
                        IS TO BE USED

                4.      STARTING PROCEDURE

                4.1     CONTROL SWITCH SETTINGS

                4.1.1   AFTER PROGRAM LOAD (INITIAL PROGRAM START)

                        ALL CONSOLE SWITCHES DOWN

                4.1.2   TO MODIFY DEVICE VECTOR AND CONTROL REGISTER ADDRESSES
                        AFTER PROGRAM RESTART

                        SW00=1

                4.1.3   TO START PROGRAM AT SELECTED TEST AFTER PROGRAM RESTART

                        SW01=1

                4.2     STARTING ADDRESS

                        THE STARTING ADDRESS FOR ALL TESTS IS 000200

                        THE RESTART ADDRESS FOR ALL TESTS I 0002000

                        THE STARTING ADDRESS TO ENTER A SELECTED TEST IS 000200

                4.3     PROGRAM AND/OR OPERATOR ACTION

                4.3.1   INITIAL PROGRAM START

                4.3.1.1 LOAD PROGRAM INTO MEMORY
                4.3.1.2 LOAD ADDRESS 000200
                4.3.1.3 CLEAR CONSOLE SWITCHES
                4.3.1.4 PRESS START
                4.3.1.5 THE PROGRAM WILL TYPE "DH11 MEMORY TEST"
                        AND WILL THEN TYPE "VECTOR ADDRESS-" AND WAIT FOR AN
                        INPUT FROM THE TELETYPE KEYBOARD.
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4.3 (CONT'D)

4.3.1.6 TYPE IN THE ADDRESS OF THE RECEIVER INTERRUPT VECTOR
FOR THE DH11 TO BE TESTED FOLLOWED BY <CARRIAGE RETURN>

NOTE: WORDS IN ANGLE BRACKETS, I.E. <CARRIAGE RETURN> MEAN THAT
THE TELETYPE KEY WITH THE NAMED FUNCTION SHOULD BE STRUCK

IF AN INCORRECT ADDRESS IS ENTERED, THE PROGRAM
WILL TYPE "?" AND WILL REPEAT THE SECOND MESSAGE OF 4.3.1.5
4.3.1.7 THE PROGRAM WILL TYPE "CONTROL REGISTER ADDRESS-"
AND WAIT FOR AN INPUT FROM THE TELETYPE KEYBOARD

4.3.1.8 TYPE IN THE ADDRESS OF THE SYSTEM CONTROL REGISTER OF THE
DH11 TO BE TESTED FOLLOWED BY <CARRIAGE RETURN>

IF AN INCORRECT ADDRESS IS TYPED, THE PROGRAM WILL TYPE
"?" AND WILL THEN REPEAT THE MESSAGE OF 4.3.1.7
4.3.1.9 THE PROGRAM WILL TYPE "R" TO INDICATE THAT IT IS
ABOUT TO START TESTING, AND THEN TESTING WILL BEGIN

4.3.2 PROGRAM RESTART WITH ALL SWITCHES DOWN

4.3.2.1 PERFORM 4.3.1.2 TO 4.3.1.5
4.3.2.2 THE PROGRAM WILL TYPE "DH11 MEMORY TEST"
AND WILL THEN CONTINUE AS DESCRIBED IN 4.3.1.9

4.3.3 PROGRAM RESTART WITH SW00=1

4.3.3.1 LOAD ADDRESS 000200
4.3.3.2 SET SW01=1
4.3.3.3 PRESS START
4.3.3.4 THE PROGRAM WILL PERFORM AS DESCRIBED IN 4.3.1.5 TO 4.3.1.9

4.3.4 PROGRAM RESTART WITH SW01=1

4.3.4.1 LOAD ADDRESS 000200
4.3.4.2 SET SW01=1
4.3.4.3 PRESS START
4.3.4.4 THE PROGRAM WILL TYPE "DH11 MEMORY TEST"
AND WILL THEN TYPE "TEST PC-" AND WILL WAIT FOR AN INPUT
FROM THE TELETYPE KEYBOARD
4.3.4.5 TYPE IN THE ADDRESS OF THE TEST AT WHICH THE PROGRAM IS TO
BE STARTED FOLLOWED BY <CARRIAGE RETURN>
4.3.4.6 THE PROGRAM WILL TYPE R TO INDICATE THAT IT HAS STARTED
AND WILL START TESTING AT THE SELECTED TEST.

NOTE: CARE MUST BE TAKEN WHEN THS FEATURE IS USED, SINCE
THERE IS NO PROTECTION AGAINST SELECTING AN ADDRESS THAT
IS IN THE MIDDLE OF A TEST

NOTE: IF IT IS DESIRED TO LOOP ON THE TEST THAT IS SELECTED
SET SW14=1 BEFORE ENTERING THE TEST ADDRESS

5. OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

SW15=1, HALT ON ERROR
SW14=1, LOOP ON CURRENT TEST
SW13=1, SUPPRESS ERROR TYPEOUT
SW11=1, INHIBIT ITERATIONS
SW10=1, ESCAPE TO NEXT TEST ON ERROR
SW09=1, FREEZE VARIABLE PARAMETER IN 'RRENT TEST
SW01=1, START PROGRAM AT SELECTED TE
SW00=1, CHANGE PARAMETERS AT PROGRAM !ART

5.2 SUBROUTINE ABSTRACTS

5.2.1 TRAPCATCHER (LOCATIONS 000000-000776)

THIS ROUTINE IS USED TO INTERCEPT UNEXPECTED INTERRUPTS
AND TRAPS. THE AREA FROM 000000-000776 IS LOADED
WITH THE FOLLOWING SEQUENCE

```
2
0
4
0
...
772
0
776
0
```

IF AN UNEXPECTED INTERRUPT OR TRAP OCCURS, THE PROGRAM
WILL HALT WITH THE PC 2 GREATER THAN THE ADDRESS TO
WHICH THE PROGRAM TRAPPED. THE PROCESSOR STACK MAY
BE EXAMINED TO DETERMINE WHERE THE PROGRAM WAS WHEN THE
TRAP OR INTERRUPT OCCURED.

5.2.2 START (PROGRAM INITIALIZATION)

THIS ROUTINE INITIALIZES ALL PROGRAM FLAGS AND COUNTERS,
TYPES THE PROGRAM TITLE MESSAGE, AND INPUTS THE VECTOR
AND CONTROL REGISTER ADDRESSES OF THE DH11 TO BE TESTED.

5.2.3 BEGIN (PROGRAM START AND RESTART)

THIS ROUTINE IS ENTERED IMMEDIATLY AFTER "START"
AND EACH TIME A PROGRAM PASS HAS BEEN COMPLETED.
THE ROUTINE SETS UP THE PROCESSOR STACK AND STATUS WORD
AND THEN TRANSFERS CONTROL TO THE TEST AT WHICH
TESTING WILL BEGIN. IF SW01=0 WHEN THIS ROUTINE IS ENTERD
TESTING WILL START AT T1 (TEST 1). IF SW01=1 WHEN
THIS ROUTINE IS ENTERED, TESTING WILL START AT THE PC
ENTERED FROM THE TELETYPE KEYBOARD.

5.2.4 EOP (END OF PASS)

THIS ROUTINE IS ENTERED ONCE PER PASS AFTER ALL TESTS
HAVE BEEN COMPLETED. THIS ROUTINE TYPES THE MAINDEC
IDENTIFICATION CODE OF THE PROGRAM, CLEARS ERROR FLAGS
AND UPDATES THE PASS COUNT. IF THE PROGRAM WAS LOADED
UNDER ACT11 OR DDP, THE ROUTINE CHECKS FOR RETURN TO
THE ACT11 OR DDP MONITOR. IF THE PROGRAM IS NOT UNDER
MONITOR CONTROL, THE ROUTINE TRANSFERS TO BEGIN.

5.2.5 SCOPER (SCOPE LOOP AND ITERATION HANDLER)

THIS ROUTINE IS ENTERED EACH TIME A TEST IS COMPLETED.
THE ROUTINE CHECKS FOR THE FOLLOWING UPON ENTRY
A) IF SW10=1, THE ROUTINE WILL TRANSFER TO THE NEXT TEST
IN SEQUENCE, AFTER CLEARING ERROR FLAGS.
B) IF SW11=1, THE ROUTINE WILL TRANSFER TO THE NEXT TEST
SEQUENCE, AFTER CLEARING ERROR FLAGS.
C) IF SW14=1, THE ROUTINE WILL LOOP ON THE CURRENT TEST
REGARDLESS OF THE ITERATION COUNT.

IF NONE OF THE ABOVE IS TRUE, THE ROUTINE WILL ADD 1
TO THE COUNT OF TEST ITERATIONS, AND COMPARE THIS VALUE
TO THE NUMBER OF ITERATIONS THAT SHOULD BE PERFORMED.
IF THESE NUMBERS ARE EQUAL, THE ROUTINE WILL TRANSFER
TO THE NEXT TEST IN SEQUENCE. THE THE NUMBERS ARE NOT
EQUAL, THE TEST CURRENTLY IN PROGRESS WILL BE REPEATED.

5.2.6 SCOP1R (FREEZE ON CURRENT DATA)

THE CALL TO THIS ROUTINE FOLLOWS IMMEDIATLY AFTER THE
THE CALL TO THE ERROR HANDLER IN THOSE TESTS THAT HAVE
VARIABLE PARAMETERS. THIS ROUTINE IS ALWAYS ENTERED IN
THOSE TESTS, WHETHER OR NOT AN ERROR OCCURS.
IF SW09=1, THE ROUTINE WILL TRANSFER CONTROL BACK TO THE
TEST AT A POINT WHICH WILL ALLOW REPEATING THE FUNCTION
UNDER TEST CONTINUOUSLY WITH THE SAME DATA. IF THIS
OPTION IS SELECTED, THE ROUTINE "SCOPER" IS NEVER ENTERED
AND ITERATION COUNTS WILL NOT BE UPDATED.

```
                5.2.7   ERRORS  (ERROR HANDLER)

                        THIS ROUTINE IS ENTERED UPON ERROR DETECTION ONLY.
                        WITH ALL CONSOLE SWITCHES DOWN, THE ROUTINE PROCEDES AS FOLLOWS:
                        A) THE PC OF THE INSTRUCTION THAT CALLED THE ERROR HANDLER
                           IS ACCESSED THRU THE STACK, AND THEN THE EMT INSTRUCTION
                           ITSELF IS FETCHED.  THE 8 LSB OF THE EMT
                           INSTRUCTION ARE THE ERROR CODE.  THIS CODE IS
                           USED TO ACCESS A TABLE OF ERROR MESSAGES AND ERROR
                           DATA STORAGE LOCATIONS.
                        B) IF THE TEST THAT FAILED DID NOT FAIL PREVIOUSLY
                           DURING THIS PASS,  A COMPLETE ERROR REPORT IS MADE
                           IF THE TEST THAT FAILED FAILED MOR THAT ONCE DURING
                           THE CURRENT PASS, ONLY THE DATA RELATING TO THE FAILUER
                           IS TYPED.  IF SW13=1, NO ERROR TYPEOUT IS MADE.
                        C) THE ROUTINE NOW CHECKS FOR HALT ON ERROR.  IF SW15=1
                           THE PROGRAM WILL HALT WITH THE PC OF THE CALL TO
                           THE ERROR ROUTINE IN R0.  IF SW15=0, THE PROGRAM WILL
                           NOT HALT, BUT WILL CHECK FOR ESCAPE TO NEXT TEST.
                        D) IF SW10=0, THE ROUTINE WILL RETURN
                           TO THE TEST IN PROGRESS.  IF SW10=1, THE ROUTINE WILL
                           ABORT THE CURRENT TEST, AND TRANSFER TO THE NEXT
                           TEST IN SEQUENCE, THRU THE ROUTINE "SCOPER".

                5.2.8   TRPSRV  (TRAP DECODE AND DISPATCH)

                        THIS ROUTINE DECODES THE 8 LSB OF THE TRAP INSTRUCTION
                        THAT CAUSED TH PROGRAM INTERRUPT, AND TRANSFERS CONTROL
                        TO THE ROUTINE THRU THE TABLE "TRPTAB" USING THE 8 LSB
                        OF THE TRAP INSTRUCTION AS  AN OFFSET TO THE POINTER TO
                        THE ROUTINE TO BE ENTERED.
```

5.3 PROGRAM AND OR OPERATOR ACTION

5.3.1 PROGRAM START WITH ALL SWITCHES DOWN

5.3.1.1 REFER TO SECTIONS 4.3.1 AND 4.3.2 FOR INITIAL PROGRAM BEHAVIOR.

5.3.1.2 AFTER "R" HAS BEEN TYPED BY THE PROGRAM, TEST EXECUTION WILL BEGIN. EACH TEST WILL BE REPEATED A SELECTED NUMBER OF ITERATIONS (SEE LISTING FOR EXACT NUMBER FOR EACH TEST) AND THEN THE PROGRAM WILL PROCEED TO THE NEXT TEST.

5.3.1.3 WHEN ALL ITERATIONS HAVE BEEN COMPLETED, THE PROGRAM WILL TYPE "CZDH8-C-C" AND THEN RESTART TESTING AT TEST 1 (LOCATION T1 IN THE PROGRAM).

5.3.1.4 IF AN ERROR OCCURS, THE PROGRAM WILL TYPE AN APPROPRIATE ERROR MESSAGE, AND THEN CONTINUE THE TEST IN PROGRESS.

5.3.2 PROGRAM START WITH SW00=1

THE PROGRAM WILL PERFORM AS DESCRIBED IN 4.3.1 AND 5.3.1

5.3.3 PROGRAM START WITH SW01=1

5.3.3.1 REFER TO SECTION 4.3.4 FOR INITIAL PROGRAM BEHAVIOR

5.3.3.2 TEST EXECUTION WILL START AT THE ADDRESS SPECIFIED AND WILL CONTINUE AS DESCRIBED IN 5.3.1.2

5.3.3.3 AFTER "CZDH8-C" HAS BEEN TYPED, THE PROGRAM WILL RESUME TESTING AT TEST 1

5.3.4 PROGRAM OPERATION WITH SW15=1

SAME AS 5.3.1, EXCEPT THAT IN THE CASE OF AN ERROR, THE PROGRAM WILL HALT AFTER THE ERROR TYPEOUT, AND THE PC+2 OF THE CALL TO THE ERROR ROUTINE WILL BE DISPLAYED IN R0.

5.3.5 PROGRAM OPERATION WITH SW13=1

SAME AS 5.3.1 EXCEPT THAT NO ERROR TYPEOUTS WILL OCCUR

5.3.6 PROGRAM OPERATION WITH SW11=1

SAME AS 5.3.1 EXCEPT THAT EACH TEST WILL BE REPEATED ONCE ONLY

5.3.7 PROGRAM OPERATION WITH SW10=1

SAME AS 5.3.1, EXCEPT THAT IN THE CASE OF AN ERROR THE CURRENT TEST WILL BE ABORTED, AND THE PROGRAM WILL PROCEED TO THE NEXT TEST IN SEQUENCE.

5. (CONT'D)

5.3.8 PROGRAM OPERATION WITH SW14=1, OR SW09=1

THESE FUNCTIONS ARE NORMALLY USED FOR TROUBLE SHOOTING.
SEE SECTION 6.3 FOR THEIR USE.

6. ERRORS

6.1 ERROR HALTS

THE ERROR MESSAGE FORMAT FOR ALL ERROR TYPEOUTS
IS AS FOLLOWS

```
PC+2    MESSAGE
        HEADER (IF APPLICABLE)
        DATA    (IF APPLICABLE)
```

WHERE
PC+2 IS THE ADDRESS OF THE CALL TO THE ERROR HANDLER + 2
MESSAGE IS AN ASCII MESSAGE DESCRIBING (BRIEFLY) THE FAILURE
HEADER IS A DESCRIPTION OF THE DATA TO FOLLOW
DATA IS OCTAL INFORMATION RELATING TO THE CAUSE OF THE FAILURE
IF THE SAME ERROR OCCURS IN A GIVEN TEST ON THE SAME
PASS, AND IF DATA IS ASSOCIATED WITH THAT ERROR, ONLY
DATA IS TYPE ON SUCCEEDING ERROR TYPEOUTS

IF NO DATA IS ASSOCIATED WITH THE ERROR
THE COMPLETE ERROR MESSAGE IS TYPED.

6.1.1 ERROR DESCRIPTIONS

SEE LISTING FOR DETAILS OF ERRORS

6.2 ERROR RECOVERY

6.2.1 SW15=0

IF THE PROGRAM IS RUN WITH SW15=0, NO OPERATOT ACTION IS
REQUIRED TO CONTINUE TESTING

6.2.2 SW15=1

IF THE PROGRAM IS RUN WITH SW15=1, TO CONTINUE TESTING
AFTER THE PROGRAM HAS HALTED, PRESS THE PROCESSOR
CONSOLE CONTINUE SWITCH

6.3 SCOPE LOOPING

6.3.1 TO SCOPE ON A SPECIFIC TEST, SET SW14=1 AND SW13=1
THIS WILL CAUSE THE PROGRAM TO CONTINUOUSLY LOOP ON THE
SAME TEST, AND WILL CAUSE ALL ERROR TYPEOUTS TO BE INHIBITED

6.3.2 TO SCOPE ON A SPECIFIC VALUE OF A PARAMETER WITHIN
A TEST, SET SW09=1 TO FREEZE THE DATA
(SEE LISTING FOR THOSE TESTS THAT INCORPORATE THIS FEATURE)

```
                        6.      (CONT'D)

                        6.3.3   PROGRAM START TO SCOPE LOOP ON SELECTED TEST

                                PERFORM SECTION 4.3.4 WITH SW14=1

                        7.      RESTRICTIONS

                        7.1     STARTING

                                THE DH11 TEST CARD MUST BE INSTALLED

                        7.2     RUNNING

                                NONE

                        8.      MISCELLANEOUS

                        8.1     EXECUTION TIME

                                THE TIME FOR ONE PASS OF THE PROGRAM (END OF
                                TYPEOUT OF CZDHB-C TO END OF TYPEOUT OF CZDHB-C)
                                IS GIVEN FOR VARIOUS PROCESSORS IN THE TABLE BELOW

                                                TIME
                                PROCESSOR

                                PDP-11/04
                                      05
                                      10
                                      15
                                      20
                                      24
                                      34
                                      35
                                      40
                                      44
                                      45
                                      55
                                      60
                                      70
                                      74
                                      84
```

9. PROGRAM DESCRIPTION

THE PROGRAM FIRST TESTS THE BUS ADDRESS AND BYTE COUNT MEMORIES FOR ADDRESSABILITY. THE TEST IS PERFORMED IN THE FOLLOWING MANNER:

A)EACH LOCATION OF THE MEMORY TO BE TESTED IS LOADED WITH ITS ADDRESS, DUPLICATED EVERY 4 BITS. THE BINARY CONTENTS OF EACH LOCATION IS SHOWN BELOW

LOCATION	CONTENTS
00	0000 0000 0000 0000
01	0001 0001 0001 0001
02	0010 0010 0010 0010
03	0011 0011 0011 0011
...	... ...
16	1110 1110 1110 1110
17	1111 1111 1111 1111

THE ABOVE PATTERN WAS CHOSEN SINCE THE MEMORY IS COMPOSED OF FOUR (4) CHIPS EACH HAVING A CAPACITY OF 16 WORDS BY FOUR (4) BITS. IF ANY OF THE FOUR CHIPS IS ADDRESSED INCORRECTLY, THE CONTENTS OF THAT CHIP WILL BE INCORRECT AND WILL INDICATION WHAT LOCATION WAS ACTUALLY ADDRESSED.

AFTER THE ABOVE TESTS HAVE BEEN COMPLETED, EACH LOCATION IN BOTH THE BUS ADDRESS AND BYTE COUNT MEMORIES ARE TESTED TO VERIFY THAT ALL BITS CAN BE SET TO 1S AND CLEARED TO 0S

THE NEXT GROUP OF TESTS VERIFY THAT A SELECTED ADDRESS IN EITHER THE BYTE COUNT OR BUS ADDRESS MEMORY CAN BE SET TO A SELECTED VALUE WITHOUT CHANGING THE CONTENTS OF ANY OTHER LOCATION IN THAT MEMORY.

THE NEXT GROUP OF TESTS SETS ALL LOCATIONS IN EITHER THE BYTE COUNT OR BUS ADDRESS MEMORY TO 1S, CLEARS A SELECTED LOCATION TO 0S, AND VERIFY THAT ONLY THE SELECTED LOCATION WAS AFFECTED.

THE FINAL GROUP OF TESTS VERIFIES THAT THE MEMORY EXTENTION BITS OF THE BUS ADDRESS MEMORY CAN BE SET AND CLEARED.

10. LISTING

↑

```
                        ; DHMAC-A - DH11 MACRO LIBRARY
                        ; COPYRIGHT 1985, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754


                        .LIST   ME
                        .NLIST  MC,MD,CND
                                                                                                        ; 3
                        ;  CMS REPLACEMENT HISTORY

                        ; *9 SKONETSKI 26-APR-1985 16:23:08 "FIXED TYPO CAUSING ASSEMBLY ERRORS"
                        ; *8 SKONETSKI 22-APR-1985 16:48:03 "TYPO ERROR IN VECTOR CHANGE CODE SOURCE FIXED"
                        ; *7 SKONETSKI 22-APR-1985 16:26:04 "ADDED CODE TO SET VECTORS FOR PWR FAIL, ERRORS, AND EMT
TRAPS."
                        ; *6 SKONETSKI 22-APR-1985 14:22:35 "FIXED BRANCH ERROR IN END OF PASS ROUTINE"
                        ; *5 SKONETSKI 22-APR-1985 08:28:54 "FIXED BUG (AN OCTASC MACRO CALL WAS WRONG) AND ADDED A
CLEAN END OF PASS
MESSAGE."
                        ; *4 SKONETSKI 18-APR-1985 14:20:15 "ADDED SOFTWARE SWITCH REG SUPPORT, BUT UNTESTED"
                        ; *3 SKONETSKI 12-APR-1985 10:34:52 "FIXED PROBLEMS WITH SPURIOUS CR/LFS"
                        ; *2 SKONETSKI 11-APR-1985 16:00:24 "ADDED MACRO FROM SYSMAC.SML THAT SIZES FOR SOFTWARE SWI
TCH REGISTER"
                        ; *1 SKONETSKI 11-APR-1985 15:49:05 "LIBRARY FOR DH11 DIAGNOSTICS"
```

```
                                .LIST   ME
                                .NLIST  MC,MD,CND
000000                          .HEADER /1976,1985/,/DH11 MEMORY TEST/,/CZDHB-CO/

                                        ;STARTING PROCEDURE
                                        ;LOAD PROGRAM
                                        ;LOAD ADDRESS 000200
                                        ;PRESS START
                                        ;PROGRAM WILL TYPE DH11 MEMORY TEST
                                        ;PROGRAM WILL TYPE "VECTOR ADDRESS-"
                                        ;TYPE IN THE ADDRESS OF THE RECEIVER INTERRUPT VECTOR
                                        ;FOR THE DH11 TO BE TESTED, FOLLOWED BY <CARRIAGE RETURN>
                                        ;PROGRAM WILL TYPE "CONTROL REGISTER ADDRESS-"
                                        ;TYPE IN THE ADDRESS OF THE SYSTEM CONTROL REGISTER
                                        ;FOR THE DH11 TO BE TESTED, FOLLOWED BY <CARRIAGE RETURN>
                                        ;PROGRAM WILL TYPE "R" TO INDICATE THAT TESTING HAS STARTED
                                        ;AT THE END OF A PASS, PROGRAM WILL TYPE " CZDHB-CO "
                                        ;AND THEN RESUM TESTING

                                .TITLE  CZDHB-CO
000000                          .ENABLE ABS
                                .NLIST  MC,MD,CND
                                .LIST   ME
000000                          .SYMBOLS

                                ;SWITCH REGISTER OPTIONS

                100000          SW15=100000             ;=1,HALT ON ERROR
                040000          SW14=40000              ;=1,LOOP ON CURRENT TEST
                020000          SW13=20000              ;=1,INHIBIT ERROR TYPEOUT
                010000          SW12=10000
                004000          SW11=4000               ;=1,INHIBIT ITERATIONS
                002000          SW10=2000               ;=1,ESCAPE TO NEXT TEST ON ERROR
                001000          SW09=1000               ;=1,LOOP WITH CURRENT DATA
                000400          SW08=400
                000100          SW06=100
                000040          SW05=40
                000020          SW04=20
                000010          SW03=10
                000004          SW02=4
                000002          SW01=2                  ;RESTART PROGRAM AT SELECTED TEST
                000001          SW00=1                  ;RESELECT VECTOR AND CONTROL REGISTER
                                                        ;ADDRESS AFTER PROGRAM RESTART
```

```
0

                        ;REGISTER DEFINITIONS

000000                  R0=%0           ;GENERAL REGISTER
000001                  R1=%1           ;GENERAL REGISTER
000002                  R2=%2           ;GENERAL REGISTER
000003                  R3=%3           ;GENERAL REGISTER
000004                  R4=%4           ;GENERAL REGISTER
000005                  R5=%5           ;GENERAL REGISTER
000006                  SP=%6           ;PROCESSOR STACK POINTER
000007                  PC=%7           ;PROGRAM COUNTER

                        ;LOCATION EQUIVALENCIES                                 ; 3

                        ;SWR=177570     ;CONSOLE SWITCH REGISTER                ; 4
                        ;LIGHTS=177570  ;PDP-11/45 DISPLAY REGISTER             ; 4
177776                  PS=177776       ;PROCESSOR STATUS WORD
012774                  STACK=ENDCOD+200    ;START OF PROCESSOR STACK           ; 3

                        ;INSTRUCTION DEFINITIONS

005746                  PUSH1SP=5746    ;DECREMENT PROCESSOR STACK 1 WORD
005726                  POP1SP=5726     ;INCREMENT PROCESSOR STACK 1 WORD
010046                  PUSHR0=10046    ;SAVE R0 ON STACK
012600                  POPR0=12600     ;RESTORE R0 FROM STACK
024646                  PUSH2SP=24646   ;DECREMENT STACK TWICE
022626                  POP2SP=22626    ;INCREMENT STACK TWICE
                        ;
                        .MACRO  HLT     $A
                                EMT     $A
                        .ENDM   HLT
                        ;
                        ;
100000                  BIT15=100000
040000                  BIT14=40000                                             ; 3
020000                  BIT13=20000
010000                  BIT12=10000
004000                  BIT11=4000
002000                  BIT10=2000
001000                  BIT09=1000
000400                  BIT08=400
000200                  BIT07=200
000100                  BIT06=100
000040                  BIT05=40
000020                  BIT04=20
000010                  BIT03=10
000004                  BIT02=4
000002                  BIT01=2
000001                  BIT00=1
1 000000                .CATCH
```

```
0
                                        ;TRAPCATCAER FOR ILLEGAL INTERRUPTS
                000000          .=0
                000200          .REPT 200
                                        .+2             ;UNEXPECTED TRAP TO THIS LOCATION
                                        HALT            ;EXAMINE STACK TO FIND CAUSE
                                .ENDR
     000000     000002                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000002     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000004     000006                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000006     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000010     000012                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000012     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000014     000016                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000016     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000020     000022                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000022     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000024     000026                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000026     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000030     000032                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000032     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000034     000036                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000036     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000040     000042                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000042     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000044     000046                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000046     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000050     000052                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000052     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000054     000056                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000056     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000060     000062                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000062     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000064     000066                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000066     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000070     000072                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000072     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000074     000076                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000076     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000100     000102                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000102     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000104     000106                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000106     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000110     000112                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000112     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000114     000116                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000116     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000120     000122                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000122     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000124     000126                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000126     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000130     000132                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000132     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000134     000136                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000136     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000140     000142                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
     000142     000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
     000144     000146                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
```

```
000146  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000150  000152          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000152  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000154  000156          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000156  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000160  000162          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000162  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000164  000166          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000166  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000170  000172          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000172  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000174  000176          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000176  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000200  000202          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000202  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000204  000206          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000206  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000210  000212          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000212  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000214  000216          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000216  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000220  000222          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000222  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000224  000226          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000226  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000230  000232          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000232  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000234  000236          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000236  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000240  000242          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000242  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000244  000246          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000246  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000250  000252          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000252  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000254  000256          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000256  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000260  000262          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000262  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000264  000266          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000266  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000270  000272          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000272  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000274  000276          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000276  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000300  000302          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000302  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000304  000306          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000306  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000310  000312          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000312  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000314  000316          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000316  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000320  000322          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000322  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000324  000326          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000326  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
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000330  000332          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000332  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000334  000336          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000336  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000340  000342          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000342  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000344  000346          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000346  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000350  000352          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000352  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000354  000356          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000356  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000360  000362          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000362  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000364  000366          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000366  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000370  000372          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000372  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000374  000376          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000376  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000400  000402          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000402  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000404  000406          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000406  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000410  000412          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000412  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000414  000416          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000416  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000420  000422          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000422  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000424  000426          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000426  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000430  000432          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000432  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000434  000436          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000436  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000440  000442          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000442  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000444  000446          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000446  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000450  000452          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000452  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000454  000456          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000456  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000460  000462          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000462  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000464  000466          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000466  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000470  000472          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000472  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000474  000476          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000476  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000500  000502          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000502  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000504  000506          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000506  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000510  000512          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
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000512  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000514  000516          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000516  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000520  000522          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000522  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000524  000526          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000526  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000530  000532          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000532  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000534  000536          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000536  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000540  000542          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000542  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000544  000546          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000546  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000550  000552          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000552  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000554  000556          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000556  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000560  000562          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000562  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000564  000566          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000566  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000570  000572          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000572  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000574  000576          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000576  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000600  000602          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000602  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000604  000606          . 2         ;UNEXPECTED TRAP TO THIS LOCATION
000606  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000610  000612          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000612  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000614  000616          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000616  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000620  000622          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000622  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000624  000626          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000626  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000630  000632          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000632  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000634  000636          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000636  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000640  000642          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000642  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000644  000646          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000646  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000650  000652          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000652  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000654  000656          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000656  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000660  000662          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000662  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000664  000666          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000666  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
000670  000672          .+2         ;UNEXPECTED TRAP TO THIS LOCATION
000672  000000          HALT        ;EXAMINE STACK TO FIND CAUSE
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000674  000676                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000676  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000700  000702                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000702  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000704  000706                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000706  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000710  000712                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000712  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000714  000716                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000716  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000720  000722                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000722  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000724  000726                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000726  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000730  000732                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000732  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000734  000736                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000736  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000740  000742                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000742  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000744  000746                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000746  00000C                  HALT            ;EXAMINE STACK TO FIND CAUSE
000750  000752                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000752  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000754  000756                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000756  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000760  000762                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000762  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000764  000766                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000766  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000770  000772                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000772  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000774  000776                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000776  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
1 001000                .SETVEC
```

```
      0
                000200                          .=200
        000200  000167  000600                  JMP     START           ;GO TO START OF PROGRAM

      1 000204                                  .TRPDEF

                                                ;DEFINITIONS FOR TRAP SUBROUTINE CALLS
                                                ;POINTERS TO SUBROUTINES CAN BE FOUND STARTING
                                                ;AT LOCATION "TRPTAB"

        000204                                  TRPDEF  SCOPE,†/SCOPE LOOP AND ITERATION HANDLER/
                104400                                  SCOPE=TRAP+Y            ;SCOPE LOOP AND ITERATION HANDLER
                000001                                  Y=Y+1
        000204                                  TRPDEF  TYPE,†/TELETYPE OUTPUT ROUTINE/
                104401                                  TYPE=TRAP+Y             ;TELETYPE OUTPUT ROUTINE
                000002                                  Y=Y+1
        000204                                  TRPDEF  OCTASC,†/OCTAL TO ASCII CONVERSION/
                104402                                  OCTASC=TRAP+Y           ;OCTAL TO ASCII CONVERSION
                000003                                  Y=Y+1
        000204                                  TRPDEF  INSTR,†/INPUT ASCII STRING/
                104403                                  INSTR=TRAP+Y            ;INPUT ASCII STRING
                000004                                  Y=Y+1
        000204                                  TRPDEF  INSTER,†/STRING INPUT ERROR/
                104404                                  INSTER=TRAP+Y           ;STRING INPUT ERROR
                000005                                  Y=Y+1
        000204                                  TRPDEF  PARAM,†/CONVERT STRING TO OCTAL, CHECK LIMITS/
                104405                                  PARAM=TRAP+Y            ;CONVERT STRING TO OCTAL, CHECK LIMITS
                000006                                  Y=Y+1
        000204                                  TRPDEF  SAV05P,†/SAVE R0-R5, PC/
                104406                                  SAV05P=TRAP+Y           ;SAVE R0-R5, PC
                000007                                  Y=Y+1
        000204                                  TRPDEF  RES05,†/RESTORE R0-R5/
                104407                                  RES05=TRAP+Y            ;RESTORE R0-R5
                000010                                  Y=Y+1
        000204                                  TRPDEF  SCOPE1,†/CHECK FOR FREEZE ON CURRENT DATA/
                104410                                  SCOPE1=TRAP+Y           ;CHECK FOR FREEZE ON CURRENT DATA
                000011                                  Y=Y+1
      2                                         .MACRO  CODEM1
      3                                                 MOV     DHSSR,DHSLR             ;SET UP ADDRESS OF SILO
      4                                                 INC     DHSLR                   ;STATUS REGISTER HIGH BYTE
      5                                         .ENDM   CODEM1
      6 000204                                  .START  DHRVEC,3,4,DHSCR,0,177776,7,10,,,1
```

```
      0         001000                  .=1000

                                        ;PROGRAM INITIALIZATION
                                        ;LOCK OUT INTERRUPTS
                                        ;SET UP PROCESSOR STACK
                                        ;SET UP POWER FAIL VECTOR
                                        ;CLEAR PROGRAM FLAGS AND COUNTS
                                        ;TYPE TITLE MESSAGE
                                .IIF NB <>,     ;DETERMINE MEMORY SIZE
                                .IIF NB <>,     ;SET UP TRACE TRAP RETURN

      001000  177570            SWR:    .WORD   177570          ; SWITCH DHSCR ADDRESS          ; 4
      001002  177570            LIGHTS: .WORD   177570          ; LIGHTS                        ; 4
                                                                                                ; 4
      001004  012767  000340  176764    START:  MOV     #340,PS         ;LOCK OUT INTERRUPTS
      001012  012706  012774            MOV     #STACK,SP       ;SET UP PROCESSOR STACK
      001016  012702  000024            MOV     #24,R2          ; POINT TO VECTOR AREA          ; 7
      001022  012722  011434            MOV     #PFAIL,(R2)+    ;SET UP POWER FAIL TRAP         ; 7
      001026  012722  000340            MOV     #340, (R2)+     ;SERVICE AT LEVEL 7             ; 7
      001032  012722  010274            MOV     #ERRORS, (R2)+  ;ERROR HANDLER                  ; 7
      001036  012722  000340            MOV     #340, (R2)+     ;SERVICE AT LEVEL 7             ; 7
      001042  012722  010506            MOV     #TRPSRV, (R2)+  ;GENERAL HANDLER DISPATCH SERVICE ; 7
      001046  012712  000340            MOV     #340, (R2)      ;SERVICE AT LEVEL 7             ; 8
      001052  005067  010352            CLR     STFLG           ;CLEAR TEST START FLAG
      001056  005067  010306            CLR     PASCNT          ;CLEAR PASS COUNT
      001062  005067  010304            CLR     ERRCNT          ;CLEAR ERROR COUNT
      001066  005067  010274            CLR     ERRFLG          ;CLEAR ERROR FLAG
      001072  005067  010270            CLR     ERRFLG          ;CLEAR LAST ERROR PC
      001076  016746  176702            MOV     4, -(SP)        ; PUSH TRAP VECTOR              ; 4
      001102  016746  176700            MOV     6, -(SP)                                        ; 4
      001106  012767  001122  176670    MOV     #1$, 4          ; SET UP TRAP VECTOR            ; 4
      001114  005777  177650            TST     @SWR            ; TEST SWITCH REGISTER ADDRESS  ; 4
      001120  000405                    BR      2$              ; IF SUCCESSFUL, LEAVE IT ALONE ; 4
      001122                    1$:                                                             ; 4
      001122  012767  000176  177650    MOV     #176, SWR       ; POINT TO SOFT SWITCH DHSCR    ; 4
      001130  005067  177646            CLR     LIGHTS          ; 0 MEANS WE ARE NOT GOING TO USE LIGHTS ; 4
      001134                    2$:                                                             ; 5
      001134  005726                    TST     (SP)+           ; CLEAN UP STACK                ; 4
      001136  005726                    TST     (SP)+                                           ; 4
      001140  012667  176642            MOV     (SP)+, 6                                        ; 4
      001144  012667  176634            MOV     (SP)+, 4                                        ; 4
      001150  104401  011604            TYPE    ,MTITLE         ;TYPE TITLE MESSAGE
      001154  005767  010246            TST     INIFLG          ;CHECK INITIALIZATION FLAG
                                .IF NB  <DHRVEC>
      001160  001001                    BNE     VEC1            ;IF NOT 0, CHECK SWITCHES
                                                                ;FOR REINITIALIZATION
                                .IFF
                                        BNE     BEGIN           ;IF NOT 0, START TEST
                                .ENDC
                                .IF NB  <>
                                SIZE:   CLR     R0
                                        MOV     #2$,@#4         ;SET UP TIME OUT RETURN
                                1$:     TST     (R0)+           ;WILL TRAP WHEN NO MEMORY       ; 9
                                        BR      1$              ;LOCATION RESPONDED, CONTINUE
                                2$:     MOV     R0,HCORE        ;R0 CONTAINS ADDRESS OF
                                        SUB     #2,HCORE        ;NON EXISTANT MEMORY            ; 9
                                        MOV     #6,@#4          ;RESTORE TRAPCATCHER
```

```
                                .ENDC
                                .IF NB  <>
                        TRACER: MOV     #1$,@#10                ;SET UP ILLEGAL INSTRUCTION TRAP RETURN
                                SXT     R0                      ;DO 11/40, 11/45 INSTRUCTION
                                MOV     #RTT,TRTRET             ;11/40,45 RTT RETURN FROM TRACE TRAP
                                BR      2$
                        1$:     MOV     #RTI,TRTRET             ;1105,10,20 RTI RETURN FROM TRACE TRAP
                                MOV     #12,@#10                ;RESTROE TRAPCATCHER
                                MOV     #TRTRET,@#16            ;SET UP TRACE TRAP VECTOR
                                .ENDC
                                .IF NB  <DHRVEC>                                                        ; 3
                                .IF B   <>
001162  000404                  BR      VEC2
                                .IFF
                                TST     INIFLG                  ;IF INITIALIZE FLAG=0
                                BEQ     VEC2                    ;GET VECTOR AND CSR ADDRESS
                                .ENDC
001164  032777  000001  177606  VEC1:   BIT     #SW00,@SWR      ;IF SW00=1, GET NEW VECTOR              ; 4
001172  001445                  BEQ     BEGIN                   ;AND CSR
001174                          VEC2:
001174  012701  000300                  MOV     #300,R1                                                 ; 4
001200  012702  000302                  MOV     #302,R2                                                 ; 4
001204  012703  000004                  MOV     #4,R3
001210  010211                  1$:     MOV     R2,(R1)         ;RESTORE TRAPCATCHER
001212  005012                          CLR     (R2)            ;IN FLOATING VECTOR AREA
001214  060301                          ADD     R3,R1
001216  060302                          ADD     R3,R2
001220  020127  001000                  CMP     R1,#1000
001224  001371                          BNE     1$
001226  104403                          INSTR                   ;INPUT ADDRESS OF DEVICE VECTOR
001230  011633                          MVECTOR                 ;MESSAGE "VECTOR ADDRESS-"
001232  104405                          PARAM                   ;CONVERT STRING TO OCTAL
001234  000300                          300                     ;LOW LIMIT
001236  000770                          770                     ;HIGH  LIMIT                            ; 3
001240  011356                          DHRVEC                  ;LOCATIONS TO BE FILLED
001242     003                  .BYTE   3                       ;NUMBER OF LOCATIONS
001243     004                  .BYTE   4                       ;LSB MASK
001244  104403                          INSTR                   ;INPUT ADDRESS OF DEVICE CSR
001246  011655                          MREGAD                  ;MESSAGE "CONTROL REGISTER ADDRESS-"
001250  104405                          PARAM                   ;CONVERT STRING TO OCTAL
001252  000000                          0                       ;LOW LIMIT
001254  177776                          177776                  ;HIGH LIMIT
001256  011334                          DHSCR                   ;LOCATIONS TO BE FILLED
001260     007                  .BYTE   7                       ;NUMBER OF LOCATIONS
001261     010                  .BYTE   10                      ;LSB MASK
                                .ENDC
                                .IF NB  <1>
001262                          CODEM1
001262  016767  010064  010064        MOV     DHSSR,DHSLR     ;SET UP ADDRESS OF SILO
001270  005267  010060                  INC     DHSLR           ;STATUS REGISTER HIGH BYTE
                                .ENDC
001274  005767  010126                  TST     INIFLG          ;IF INITIALIZATION FLAG
001300  001002                          BNE     BEGIN           ;IS CLEARED
001302  005167  010120                  COM     INIFLG          ;SET IT

                                ;PROGRAM START                                                          ; 3
                                ;CHECK FOR PROGRAM START AT SELECTED ADDRESS
```

```
001306  012767  000340  176462  BEGIN:  MOV     #340,PS         ;LOCK OUT INTERRUPTS
001314  012706  012774                  MOV     #STACK,SP       ;SET UP PROCESSOR STACK
001320  032777  000002  177452          BIT     #SW01,@SWR      ;IF SW01=1
001326  001410                          BEQ     1$              ;GET PC FOR PROGRAM START       ; 4
001330  104403                          INSTR                   ;GET PC
001332  012044                          MTSTPC                  ;MESSAGE "TEST PC"
001334  104405                          PARAM                   ;CONVERT STRING TO OCTAL
001336  000000                          0
001340  017500                          17500
001342  011374                          RETRN
001344     001                  .BYTE   1
001345     001                  .BYTE   1
001346  000410                          BR      2$
001350  012767  001400  010016  1$:     MOV     #T1,RETRN       ;NORMAL START, TEST 1
001356  005767  010046                  TST     STFLG           ;IF LOOPING, BYPASS TYPEOUT
001362  001004                          BNE     3$
001364  005167  010040                  COM     STFLG
001370  104401  012040          2$:     TYPE    ,MR             ;TYPE "R" TO INDICATE START
001374  000177  007774          3$:     JMP     @RETRN          ;START TESTING                  ; 3
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     2 001400                           MEMT1   ↑/BA/,↑/BUS ADDRESS/

                                                ;BUS ADDRESS MEMORY ADDRESSING TEST
                                                ;LOAD EACH LOCATION IN THE BUS ADDRESS MEMORY
                                                ;WITH THE ADDRESS OF THAT LOCATION.
                                                ;THE ADDRESS IS REPEATED EVERY 4 BITS
                                                ;VERIFY THAT EACH LOCATION IN THE BUS ADDRESS MEMORY
                                                ;WAS ADDRESSED.

     001400                                     TS \XN,100,4$
     001400  012767  000340  176370  T1:        MOV     #340,PS         ;DISABLE ALL INTERRUPTS
     001406  012767  000100  007766             MOV     #100,ICOUNT     ;SET UP FOR 100 ITERATIONS
     001414  012767  001514  007754             MOV     #4$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
                                                .IF NB  <>
                                                MOV     #,FREEZ1        ;SET UP TO LOOP WITH DATA       ; 3
                                                .ENDC
             000002                             XN=XN+1
     001422  012700  000020                     MOV     #20,R0          ;SET UP TO ADDRESS 20 (OCTAL)
                                                                        ;LOCATIONS IN THE BUS ADDRESS MEMORY
     001426  005004                             CLR     R4              ;START AT ADDRESS 0
     001430  005002                             CLR     R2
     001432  010477  007676             1$:     MOV     R4,@DHSCR       ;SELECT ADDRESS IN BUS ADDRESS
                                                                        ;MEMORY TO BE ADDRESSED
     001436  010277  007700                     MOV     R2,@DHBA        ;LOAD MEMORY LOCATION
     001442  062702  010421                     ADD     #10421,R2       ;WITH ITS ADDRESS
     001446  005204                             INC     R4              ;ADVANCE TO NEXT ADDRESS
     001450  005300                             DEC     R0
     001452  001367                             BNE     1$              ;CONTINUE IF NOT DONE
     001454  012700  000020                     MOV     #20,R0          ;SET UP TO CHECK
                                                                        ;EACH MEMORY ADDRESS
     001460  005004                             CLR     R4              ;START AT ADDRESS 0
     001462  005002                             CLR     R2
     001464  010477  007644             2$:     MOV     R4,@DHSCR       ;ADDRESS MEMORY LOCATION
     001470  017703  007646                     MOV     @DHBA,R3        ;READ CONTENTS OF MEMORY
     001474  020203                             CMP     R2,R3           ;WAS MEMORY LOCATION LOADED
                                                                        ;WITH ITS ADDRESS
     001476  001401                             BEQ     3$
     001500                                     .IIF IDN        <BA>,<BA>,      HLT     1       ;BUS ADDRESS MEMORY ERROR
     001500  104001                             EMT     1
                                                .IIF IDN        <BA>,<BC>,      HLT     2       ;BYTE COUNT MEMORY ERROR
     001502  005204                     3$:     INC     R4              ;ADVANCE TO NEXT LOCATION
     001504  062702  010421                     ADD     #10421,R2
     001510  005300                             DEC     R0
     001512  001364                             BNE     2$              ;CONTINUE IF NOT DONE
     001514  104400                     4$:     SCOPE
     3 001516                           MEMT1   ↑/BC/,↑/BYTE COUNT/

                                                ;BYTE COUNT MEMORY ADDRESSING TEST
                                                ;LOAD EACH LOCATION IN THE BYTE COUNT MEMORY
                                                ;WITH THE ADDRESS OF THAT LOCATION.
                                                ;THE ADDRESS IS REPEATED EVERY 4 BITS
                                                ;VERIFY THAT EACH LOCATION IN THE BYTE COUNT MEMORY
                                                ;WAS ADDRESSED.

     001516                                     TS \XN,100,4$
     001516  012767  000340  176252  T2:        MOV     #340,PS         ;DISABLE ALL INTERRUPTS
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001524  012767  000100  007650          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
001532  012767  001632  007636          MOV     #4$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000003                  XN=XN+1
001540  012700  000020                  MOV     #20,R0                  ;SET UP TO ADDRESS 20 (OCTAL)
                                                                        ;LOCATIONS IN THE BYTE COUNT MEMORY
001544  005004                          CLR     R4                      ;START AT ADDRESS 0
001546  005002                          CLR     R2
001550  010477  007560          1$:     MOV     R4,@DHSCR               ;SELECT ADDRESS IN BYTE COUNT
                                                                        ;MEMORY TO BE ADDRESSED
001554  010277  007564                  MOV     R2,@DHBC                ;LOAD MEMORY LOCATION
001560  062702  010421                  ADD     #10421,R2               ;WITH ITS ADDRESS
001564  005204                          INC     R4                      ;ADVANCE TO NEXT ADDRESS
001566  005300                          DEC     R0
001570  001367                          BNE     1$                      ;CONTINUE IF NOT DONE
001572  012700  000020                  MOV     #20,R0                  ;SET UP TO CHECK
                                                                        ;EACH MEMORY ADDRESS
001576  005004                          CLR     R4                      ;START AT ADDRESS 0
001600  005002                          CLR     R2
001602  010477  007526          2$:     MOV     R4,@DHSCR               ;ADDRESS MEMORY LOCATION
001606  017703  007532                  MOV     @DHBC,R3                ;READ CONTENTS OF MEMORY
001612  020203                          CMP     R2,R3                   ;WAS MEMORY LOCATION LOADED
                                                                        ;WITH ITS ADDRESS
001614  001401                          BEQ     3$
                                .IIF IDN        <BC>,<BA>,      HLT     1                       ;BUS ADDRESS MEMORY ERROR
001616                          .IIF IDN        <BC>,<BC>,      HLT     2                       ;BYTE COUNT MEMORY ERROR
001616  104002                          EMT     2
001620  005204                  3$:     INC     R4                      ;ADVANCE TO NEXT LOCATION
001622  062702  010421                  ADD     #10421,R2
001626  005300                          DEC     R0
001630  001364                          BNE     2$                      ;CONTINUE IF NOT DONE
001632  104400                  4$:     SCOPE
      5 000000                  XADRS=0
      6 000000                  XCADRS=0
      7 000000                  ADRS=XADRS
      8 000000                  CADRS=XCADRS
     10 000020                  .REPT   16.
     11                         MEMT2   +/BA/,+/BUS ADDRESS/,\XADRS,\XCADRS,177777,+/177777/
     12                         .NLIST
     13                         XADRS=XADRS+1
     14                         XCADRS=XCADRS+1
     15                         .LIST
     16                         .ENDR
001634                          MEMT2   +/BA/,+/BUS ADDRESS/,\XADRS,\XCADRS,177777,+/177777/

                                        ;BUS ADDRESS MEMORY DATA TEST
                                        ;VERIFY THAT ADDRESS 0 OF BUS ADDRESS MEMORY
                                        ;CAN BE SET TO 177777 AND CLEARED TO 0

001634                          TS \XN,100,2$
001634  012767  000340  176134  T3:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
001642  012767  000100  007532          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
001650  012767  001730  007520          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
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                        .ENDC
        000004          XN=XN+1
001656  012705  177777          MOV     #177777,R5              ;EXPECTED RESULT=177777
001662  012777  000000  007444  MOV     #0,@DHSCR               ;SELECT LOCATION 0
                                                                ;OF BUS ADDRESS MEMORY
001670  012777  177777  007444  MOV     #177777,@DHBA           ;WRITE 177777 INTO MEMORY
001676  017704  007440          MOV     @DHBA,R4                ;READ CONTENTS OF MEMORY LOCATION
001702  020504                  CMP     R5,R4                   ;COMPARE EXPECTED AND
001704  001401                  BEQ     1$                      ;RECEIVED MEMORY CONTENTS
001706                  .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
001706  104003                  EMT     3
                        .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
001710  005005          1$:     CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
001712  042777  177777  007422  BIC     #177777,@DHBA           ;CLEAR MEMORY LOCATION
001720  017704  007416          MOV     @DHBA,R4                ;READ CONTENTS OF BUS ADDRESS
                                                                ;MEMORY ADDRESS 0
001724  001401                  BEQ     2$
001726                  .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
001726  104003                  EMT     3
                        .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
                                                                ;ADDRESS 0 NOT 0, ERROR
001730  104400          2$:     SCOPE
        000001          XADRS=XADRS+1
        000001          XCADRS=XCADRS+1
001732                  MEMT2   ↑/BA/,↑/BUS ADDRESS/,\XADRS,\XCADRS,177777,↑/177777/

                                ;BUS ADDRESS MEMORY DATA TEST
                                ;VERIFY THAT ADDRESS 1 OF BUS ADDRESS MEMORY
                                ;CAN BE SET TO 177777 AND CLEARED TO 0

001732                  TS \XN,100,2$
001732  012767  000340  176036  T4:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
001740  012767  000100  007434          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
001746  012767  002026  007422          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                        .IF NB  <>
                                MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                        .ENDC
        000005          XN=XN+1
001754  012705  177777          MOV     #177777,R5              ;EXPECTED RESULT=177777
001760  012777  000001  007346  MOV     #1,@DHSCR               ;SELECT LOCATION 1
                                                                ;OF BUS ADDRESS MEMORY
001766  012777  177777  007346  MOV     #177777,@DHBA           ;WRITE 177777 INTO MEMORY
001774  017704  007342          MOV     @DHBA,R4                ;READ CONTENTS OF MEMORY LOCATION
002000  020504                  CMP     R5,R4                   ;COMPARE EXPECTED AND
002002  001401                  BEQ     1$                      ;RECEIVED MEMORY CONTENTS
002004                  .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
002004  104003                  EMT     3
                        .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
002006  005005          1$:     CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
002010  042777  177777  007324  BIC     #177777,@DHBA           ;CLEAR MEMORY LOCATION
002016  017704  007320          MOV     @DHBA,R4                ;READ CONTENTS OF BUS ADDRESS
                                                                ;MEMORY ADDRESS 1
002022  001401                  BEQ     2$
002024                  .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
002024  104003                  EMT     3
                        .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
                                                                ;ADDRESS 1 NOT 0, ERROR
```

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002026  104400                  2$:     SCOPE
        000002                  XADRS=XADRS+1
        000002                  XCADRS=XCADRS+1
002030                          MEMT2   ^/BA/,^/BUS ADDRESS/,\XADRS,\XCADRS,177777,^/177777/

                                ;BUS ADDRESS MEMORY DATA TEST
                                ;VERIFY THAT ADDRESS 2 OF BUS ADDRESS MEMORY
                                ;CAN BE SET TO 177777 AND CLEARED TO 0

002030                          TS \XN,100,2$
002030  012767  000340  175740  T5:     MOV     @340,PS                 ;DISABLE ALL INTERRUPTS
002036  012767  000100  007336          MOV     @100,ICOUNT             ;SET UP FOR 100 ITERATIONS
002044  012767  002124  007324          MOV     @2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     @,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000006                  XN=XN+1
002052  012705  177777                  MOV     @177777,R5              ;EXPECTED RESULT=177777
002056  012777  000002  007250          MOV     @2,@DHSCR               ;SELECT LOCATION 2
                                                                        ;OF BUS ADDRESS MEMORY
002064  012777  177777  007250          MOV     @177777,@DHBA           ;WRITE 177777 INTO MEMORY
002072  017704  007244                  MOV     @DHBA,R4                ;READ CONTENTS OF MEMORY LOCATION
002076  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
002100  001401                          BEQ     1$                      ;RECEIVED MEMORY CONTENTS
002102                          .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
002102  104003                          EMT     3
                                .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
002104  005005                  1$:     CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
002106  042777  177777  007226          BIC     @177777,@DHBA           ;CLEAR MEMORY LOCATION
002114  017704  007222                  MOV     @DHBA,R4                ;READ CONTENTS OF BUS ADDRESS
                                                                        ;MEMORY ADDRESS 2
002120  001401                          BEQ     2$
002122                          .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
002122  104003                          EMT     3
                                .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
                                                                        ;ADDRESS 2 NOT 0, ERROR
002124  104400                  2$:     SCOPE
        000003                  XADRS=XADRS+1
        000003                  XCADRS=XCADRS+1
002126                          MEMT2   ^/BA/,^/BUS ADDRESS/,\XADRS,\XCADRS,177777,^/177777/

                                ;BUS ADDRESS MEMORY DATA TEST
                                ;VERIFY THAT ADDRESS 3 OF BUS ADDRESS MEMORY
                                ;CAN BE SET TO 177777 AND CLEARED TO 0

002126                          TS \XN,100,2$
002126  012767  000340  175642  T6:     MOV     @340,PS                 ;DISABLE ALL INTERRUPTS
002134  012767  000100  007240          MOV     @100,ICOUNT             ;SET UP FOR 100 ITERATIONS
002142  012767  002222  007226          MOV     @2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     @,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000007                  XN=XN+1
002150  012705  177777                  MOV     @177777,R5              ;EXPECTED RESULT=177777
002154  012777  000003  007152          MOV     @3,@DHSCR               ;SELECT LOCATION 3
                                                                        ;OF BUS ADDRESS MEMORY
002162  012777  177777  007152          MOV     @177777,@DHBA           ;WRITE 177777 INTO MEMORY
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002170  017704  007146          MOV     @DH8A,R4                ;READ CONTENTS OF MEMORY LOCATION
002174  020504                  CMP     R5,R4                   ;COMPARE EXPECTED AND
002176  001401                  BEQ     1$                      ;RECEIVED MEMORY CONTENTS
002200                  .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
002200  104003                  EMT     3
                        .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
002202  005005          1$:     CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
002204  042777  177777  007130        BIC     #177777,@DH8A           ;CLEAR MEMORY LOCATION
002212  017704  007124                MOV     @DH8A,R4                ;READ CONTENTS OF BUS ADDRESS
                                                                ;MEMORY ADDRESS 3
002216  001401                  BEQ     2$
002220                  .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
002220  104003                  EMT     3
                        .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
                                                                ;ADDPESS 3 NOT 0, ERROR
002222  104400          2$:     SCOPE
                        XADRS=XADRS+1
                        XCADRS=XCADRS+1
002224                  MEMT2   ^/BA/,^/BUS ADDRESS/,\XADRS,\XCADRS,177777,^/177777/

                                ;BUS ADDRESS MEMORY DATA TEST
                                ;VERIFY THAT ADDRESS 4 OF BUS ADDRESS MEMORY
                                ;CAN BE SET TO 177777 AND CLEARED TO 0

002224                  TS \XN,100,2$
002224  012767  000340  175544  T7:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
002232  012767  000100  007142        MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
002240  012767  002320  007130        MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                        .IF NB  <>
                                MOV     #.,FREEZ1               ;SET UP TO LOOP WITH DATA       ; 3
                        .ENDC
        000010          XN=XN+1
002246  012705  177777          MOV     #177777,R5              ;EXPECTED RESULT=177777
002252  012777  000004  007054        MOV     #4,@DH8CR               ;SELECT LOCATION 4
                                                                ;OF BUS ADDRESS MEMORY
002260  012777  177777  007054        MOV     #177777,@DH8A           ;WRITE 177777 INTO MEMORY
002266  017704  007050                MOV     @DH8A,R4                ;READ CONTENTS OF MEMORY LOCATION
002272  020504                  CMP     R5,R4                   ;COMPARE EXPECTED AND
002274  001401                  BEQ     1$                      ;RECEIVED MEMORY CONTENTS
002276                  .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
002276  104003                  EMT     3
                        .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
002300  005005          1$:     CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
002302  042777  177777  007032        BIC     #177777,@DH8A           ;CLEAR MEMORY LOCATION
002310  017704  007026                MOV     @DH8A,R4                ;READ CONTENTS OF BUS ADDRESS
                                                                ;MEMORY ADDRESS 4
002314  001401                  BEQ     2$
002316                  .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
002316  104003                  EMT     3
                        .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
                                                                ;ADDRESS 4 NOT 0, ERROR
002320  104400          2$:     SCOPE
                        XADRS=XADRS+1
                        XCADRS=XCADRS+1
002322                  MEMT2   ^/BA/,^/BUS ADDRESS/,\XADRS,\XCADRS,177777,^/177777/

                                ;BUS ADDRESS MEMORY DATA TEST
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                                ;VERIFY THAT ADDRESS 5 OF BUS ADDRESS MEMORY
                                ;CAN BE SET TO 177777 AND CLEARED TO 0

002322                          TS \XN,100,2$
002322  012767  000340  175446  T10:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
002330  012767  000100  007044          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
002336  012767  002416  007032          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000011                  XN=XN+1
002344  012705  177777                  MOV     #177777,R5              ;EXPECTED RESULT=177777
002350  012777  000005  006756          MOV     #5,@DHSCR               ;SELECT LOCATION 5
                                                                        ;OF BUS ADDRESS MEMORY
002356  012777  177777  006756          MOV     #177777,@DHBA           ;WRITE 177777 INTO MEMORY
002364  017704  006752                  MOV     @DHBA,R4                ;READ CONTENTS OF MEMORY LOCATION
002370  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
002372  001401                          BEQ     1$                      ;RECEIVED MEMORY CONTENTS
002374                          .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
002374  104003                          EMT     3
                                .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
002376  005005                  1$:     CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
002400  042777  177777  006734          BIC     #177777,@DHBA           ;CLEAR MEMORY LOCATION
002406  017704  006730                  MOV     @DHBA,R4                ;READ CONTENTS OF BUS ADDRESS
                                                                        ;MEMORY ADDRESS 5
002412  001401                          BEQ     2$
002414                          .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
002414  104003                          EMT     3
                                .IIF IDN        <[illegible],<BC>,      HLT     4               ;BYTE COUNT MEMORY ERROR
                                                                        ;ADDRESS 5 NOT 0, ERROR
002416  104400                  2$:     SCOPE
        000006                  XADRS=XADRS+1
        000006                  XCADRS=XCADRS+1
002420                          MEMT2   ^/BA/,^/BUS ADDRESS/,\XADRS,\XCADRS,177777,^/177777/

                                ;BUS ADDRESS MEMORY DATA TEST
                                ;VERIFY THAT ADDRESS 6 OF BUS ADDRESS MEMORY
                                ;CAN BE SET TO 177777 AND CLEARED TO 0

002420                          TS \XN,100,2$
002420  012767  000340  175350  T11:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
002426  012767  000100  006746          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
002434  012767  002514  006734          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000012                  XN=XN+1
002442  012705  177777                  MOV     #177777,R5              ;EXPECTED RESULT=177777
002446  012777  000006  006660          MOV     #6,@DHSCR               ;SELECT LOCATION 6
                                                                        ;OF BUS ADDRESS MEMORY
002454  012777  177777  006660          MOV     #177777,@DHBA           ;WRITE 177777 INTO MEMORY
002462  017704  006654                  MOV     @DHBA,R4                ;READ CONTENTS OF MEMORY LOCATION
002466  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
002470  001401                          BEQ     1$                      ;RECEIVED MEMORY CONTENTS
002472                          .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
002472  104003                          EMT     3
                                .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
```

```
002474  005005                  1$:     CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
002476  042777  177777  006636          BIC     #177777,@DHBA           ;CLEAR MEMORY LOCATION
002504  017704  006632                  MOV     @DHBA,R4                ;READ CONTENTS OF BUS ADDRESS
                                                                        ;MEMORY ADDRESS 6
002510  001401                          BEQ     2$
002512                          .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
002512  104003                          EMT     3
                                .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
                                                                        ;ADDRESS 6 NOT 0, ERROR
002514  104400                  2$:     SCOPE
        000007                  XADRS=XADRS+1
        000007                  XCADRS=XCADRS+1
002516                          MEMT2   ^/BA/,^/BUS ADDRESS/,\XADRS,\XCADRS,177777,^/177777/

                                        ;BUS ADDRESS MEMORY DATA TEST
                                        ;VERIFY THAT ADDRESS 7 OF BUS ADDRESS MEMORY
                                        ;CAN BE SET TO 177777 AND CLEARED TO 0

002516                          TS \XN,100,2$
002516  012767  000340  175252  T12:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
002524  012767  000100  006650          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
002532  012767  002612  006636          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000013                  XN=XN+1
002540  012705  177777                  MOV     #177777,R5              ;EXPECTED RESULT=177777
002544  012777  000007  006562          MOV     #7,@DHSCR               ;SELECT LOCATION 7
                                                                        ;OF BUS ADDRESS MEMORY
002552  012777  177777  006562          MOV     #177777,@DHBA           ;WRITE 177777 INTO MEMORY
002560  017704  006556                  MOV     @DHBA,R4                ;READ CONTENTS OF MEMORY LOCATION
002564  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
002566  001401                          BEQ     1$                      ;RECEIVED MEMORY CONTENTS
002570                          .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
002570  104003                          EMT     3
                                 IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
002572  005005                  1$:     CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
002574  042777  177777  006540          BIC     #177777,@DHBA           ;CLEAR MEMORY LOCATION
002602  017704  006534                  MOV     @DHBA,R4                ;READ CONTENTS OF BUS ADDRESS
                                                                        ;MEMORY ADDRESS 7
002606  001401                          BEQ     2$
002610                          .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
002610  104003                          EMT     3
                                .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
                                                                        ;ADDRESS 7 NOT 0, ERROR
002612  104400                  2$:     SCOPE
        000010                  XADRS=XADRS+1
        000010                  XCADRS=XCADRS+1
002614                          MEMT2   ^/BA/,^/BUS ADDRESS/,\XADRS,\XCADRS,177777,^/177777/

                                        ;BUS ADDRESS MEMORY DATA TEST
                                        ;VERIFY THAT ADDRESS 10 OF BUS ADDRESS MEMORY
                                        ;CAN BE SET TO 177777 AND CLEARED TO 0

002614                          TS \XN,100,2$
002614  012767  000340  175154  T13:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
002622  012767  000100  006552          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
```

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002630  012767  002710  006540          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000014                  XN=XN+1
002636  012705  177777                  MOV     #177777,R5              ;EXPECTED RESULT=177777
002642  012777  000010  006464          MOV     #10,@DHSCR              ;SELECT LOCATION 10
                                                                        ;OF BUS ADDRESS MEMORY
002650  012777  177777  006464          MOV     #177777,@DHBA           ;WRITE 177777 INTO MEMORY
002656  017704  006460                  MOV     @DHBA,R4                ;READ CONTENTS OF MEMORY LOCATION
002662  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
002664  001401                          BEQ     1$                      ;RECEIVED MEMORY CONTENTS
002666                          .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
002666  104003                          EMT     3
                                .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
002670  005005                  1$:     CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
002672  042777  177777  006442          BIC     #177777,@DHBA           ;CLEAR MEMORY LOCATION
002700  017704  006436                  MOV     @DHBA,R4                ;READ CONTENTS OF BUS ADDRESS
                                                                        ;MEMORY ADDRESS 10
002704  001401                          BEQ     2$
002706                          .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
002706  104003                          EMT     3
                                .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
                                                                        ;ADDRESS 10 NOT 0, ERROR
002710  104400                  2$:     SCOPE
        000011                  XADRS=XADRS+1
        000011                  XCADRS=XCADRS+1
002712                          MEMT2   ^/BA/,^/BUS ADDRESS/,\XADRS,\XCADRS,177777,^/177777/

                                ;BUS ADDRESS MEMORY DATA TEST
                                ;VERIFY THAT ADDRESS 11 OF BUS ADDRESS MEMORY
                                ;CAN BE SET TO 177777 AND CLEARED TO 0

002712                          TS \XN,100,2$
002712  012767  000340  175056  T14:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
002720  012767  000100  006454          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
002726  012767  003006  006442          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000015                  XN=XN+1
002734  012705  177777                  MOV     #177777,R5              ;EXPECTED RESULT=177777
002740  012777  000011  006366          MOV     #11,@DHSCR              ;SELECT LOCATION 11
                                                                        ;OF BUS ADDRESS MEMORY
002746  012777  177777  006366          MOV     #177777,@DHBA           ;WRITE 177777 INTO MEMORY
002754  017704  006362                  MOV     @DHBA,R4                ;READ CONTENTS OF MEMORY LOCATION
002760  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
002762  001401                          BEQ     1$                      ;RECEIVED MEMORY CONTENTS
002764                          .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
002764  104003                          EMT     3
                                .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
002766  005005                  1$:     CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
002770  042777  177777  006344          BIC     #177777,@DHBA           ;CLEAR MEMORY LOCATION
002776  017704  006340                  MOV     @DHBA,R4                ;READ CONTENTS OF BUS ADDRESS
                                                                        ;MEMORY ADDRESS 11
003002  001401                          BEQ     2$
003004                          .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
```

```
003004  104003                          EMT     3
                        .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
                                                                                        ;ADDRESS 11 NOT 0, ERROR
003006  104400          2$:     SCOPE
        000012          XADRS=XADRS+1
        000012          XCADRS=XCADRS+1
003010                  MEMT2   +/BA/,+/BUS ADDRESS/,\XADRS,\XCADRS,177777,+/177777/

                        ;BUS ADDRESS MEMORY DATA TEST
                        ;VERIFY THAT ADDRESS 12 OF BUS ADDRESS MEMORY
                        ;CAN BE SET TO 177777 AND CLEARED TO 0

003010                  TS \XN,100,2$
003010  012767  000340  174760  T15:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
003016  012767  000100  006356          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
003024  012767  003104  006344          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                        .IF NB  <>
                                MOV     #,FREEZ1                        ;SET UP TO LOOP WITH DATA       ; 3
                        .ENDC
        000016          XN=XN+1
003032  012705  177777          MOV     #177777,R5                      ;EXPECTED RESULT=177777
003036  012777  000012  006270          MOV     #12,@DHSCR              ;SELECT LOCATION 12
                                                                        ;OF BUS ADDRESS MEMORY
003044  012777  177777  006270          MOV     #177777,@DHBA           ;WRITE 177777 INTO MEMORY
003052  017704  006264                  MOV     @DHBA,R4                ;READ CONTENTS OF MEMORY LOCATION
003056  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
003060  001401                          BEQ     1$                      ;RECEIVED MEMORY CONTENTS
003062                  .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
003062  104003                  EMT     3
                        .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
003064  005005          1$:     CLR     R5                              ;EXPECTED RESULT AFTER CLEAR=0
003066  042777  177777  006246          BIC     #177777,@DHBA           ;CLEAR MEMORY LOCATION
003074  017704  006242                  MOV     @DHBA,R4                ;READ CONTENTS OF BUS ADDRESS
                                                                        ;MEMORY ADDRESS 12
003100  001401                          BEQ     2$
003102                  .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
003102  104003                  EMT     3
                        .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
                                                                                        ;ADDRESS 12 NOT 0, ERROR
003104  104400          2$:     SCOPE
        000013          XADRS=XADRS+1
        000013          XCADRS=XCADRS+1
003106                  MEMT2   +/BA/,+/BUS ADDRESS/,\XADRS,\XCADRS,177777,+/177777/

                        ;BUS ADDRESS MEMORY DATA TEST
                        ;VERIFY THAT ADDRESS 13 OF BUS ADDRESS MEMORY
                        ;CAN BE SET TO 177777 AND CLEARED TO 0

003106                  TS \XN,100,2$
003106  012767  000340  174662  T16:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
003114  012767  000100  006260          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
003122  012767  003202  006246          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                        .IF NB  <>
                                MOV     #,FREEZ1                        ;SET UP TO LOOP WITH DATA       ; 3
                        .ENDC
        000017          XN=XN+1
003130  012705  177777          MOV     #177777,R5                      ;EXPECTED RESULT=177777
```

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003134  012777  000013  006172          MOV     #13,@DHSCR              ;SELECT LOCATION 13
                                                                        ;OF BUS ADDRESS MEMORY
003142  012777  177777  006172          MOV     #177777,@DHBA           ;WRITE 177777 INTO MEMORY
003150  017704  006166                  MOV     @DHBA,R4                ;READ CONTENTS OF MEMORY LOCATION
003154  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
003156  001401                          BEQ     1$                      ;RECEIVED MEMORY CONTENTS
003160                          .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
003160  104003                          EMT     3
                                .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
003162  005005                  1$:     CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
003164  042777  177777  006150          BIC     #177777,@DHBA           ;CLEAR MEMORY LOCATION
003172  017704  006144                  MOV     @DHBA,R4                ;READ CONTENTS OF BUS ADDRESS
                                                                        ;MEMORY ADDRESS 13
003176  001401                          BEQ     2$
003200                          .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
003200  104003                          EMT     3
                                .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
                                                                        ;ADDRESS 13 NOT 0, ERROR
003202  104400                  2$:     SCOPE
        000014                  XADRS=XADRS+1
        000014                  XCADRS=XCADRS+1
003204                          MEMT2   +/BA/,+/BUS ADDRESS/,\XADRS,\XCADRS,177777,+/177777/

                                ;BUS ADDRESS MEMORY DATA TEST
                                ;VERIFY THAT ADDRESS 14 OF BUS ADDRESS MEMORY
                                ;CAN BE SET TO 177777 AND CLEARED TO 0

003204                          TS \XN,100,2$
003204  012767  000340  174564  T17:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
003212  012767  000100  006162          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
003220  012767  003300  006150          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000020                  XN=XN+1
003226  012705  177777                  MOV     #177777,R5              ;EXPECTED RESULT=177777
003232  012777  000014  006074          MOV     #14,@DHSCR              ;SELECT LOCATION 14
                                                                        ;OF BUS ADDRESS MEMORY
003240  012777  177777  006074          MOV     #177777,@DHBA           ;WRITE 177777 INTO MEMORY
003246  017704  006070                  MOV     @DHBA,R4                ;READ CONTENTS OF MEMORY LOCATION
003252  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
003254  001401                          BEQ     1$                      ;RECEIVED MEMORY CONTENTS
003256                          .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
003256  104003                          EMT     3
                                .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
003260  005005                  1$:     CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
003262  042777  177777  006052          BIC     #177777,@DHBA           ;CLEAR MEMORY LOCATION
003270  017704  006046                  MOV     @DHBA,R4                ;READ CONTENTS OF BUS ADDRESS
                                                                        ;MEMORY ADDRESS 14
003274  001401                          BEQ     2$
003276                          .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
003276  104003                          EMT     3
                                .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
                                                                        ;ADDRESS 14 NOT 0, ERROR
003300  104400                  2$:     SCOPE
        000015                  XADRS=XADRS+1
        000015                  XCADRS=XCADRS+1
```

```
003302                          MEMT2   ↑/BA/,↑/BUS ADDRESS/,\XADRS,\XCADRS,177777,↑/177777/

                                        ;BUS ADDRESS MEMORY DATA TEST
                                        ;VERIFY THAT ADDRESS 15 OF BUS ADDRESS MEMORY
                                        ;CAN BE SET TO 177777 AND CLEARED TO 0

003302                          TS \XN,100,2$
003302  012767  000340  174466  T20:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
003310  012767  000100  006064          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
003316  012767  003376  006052          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     ^,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000021                  XN=XN+1
003324  012705  177777                  MOV     #177777,R5              ;EXPECTED RESULT=177777
003330  012777  000015  005776          MOV     #15,@DHSCR              ;SELECT LOCATION 15
                                                                        ;OF BUS ADDRESS MEMORY
003336  012777  177777  005776          MOV     #177777,@DHBA           ;WRITE 177777 INTO MEMORY
003344  017704  005772                  MOV     @DHBA,R4                ;READ CONTENTS OF MEMORY LOCATION
003350  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
003352  001401                          BEQ     1$                      ;RECEIVED MEMORY CONTENTS
003354                          .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
003354  104003                          EMT     3
                                .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
003356  005005                  1$:     CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
003360  042777  177777  005754          BIC     #177777,@DHBA           ;CLEAR MEMORY LOCATION
003366  017704  005750                  MOV     @DHBA,R4                ;READ CONTENTS OF BUS ADDRESS
                                                                        ;MEMORY ADDRESS 15
003372  001401                          BEQ     2$
003374                          .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
003374  104003                          EMT     3
                                .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
                                                                        ;ADDRESS 15 NOT 0, ERROR
003376  104400                  2$:     SCOPE
        000016                  XADRS=XADRS+1
        000016                  XCADRS=XCADRS+1
003400                          MEMT2   ↑/BA/,↑/BUS ADDRESS/,\XADRS,\XCADRS,177777,↑/177777/

                                        ;BUS ADDRESS MEMORY DATA TEST
                                        ;VERIFY THAT ADDRESS 16 OF BUS ADDRESS MEMORY
                                        ;CAN BE SET TO 177777 AND CLEARED TO 0

003400                          TS \XN,100,2$
003400  012767  000340  174370  T21:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
003406  012767  000100  005766          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
003414  012767  003474  005754          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     ^,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000022                  XN=XN+1
003422  012705  177777                  MOV     #177777,R5              ;EXPECTED RESULT=177777
003426  012777  000016  005700          MOV     #16,@DHSCR              ;SELECT LOCATION 16
                                                                        ;OF BUS ADDRESS MEMORY
003434  012777  177777  005700          MOV     #177777,@DHBA           ;WRITE 177777 INTO MEMORY
003442  017704  005674                  MOV     @DHBA,R4                ;READ CONTENTS OF MEMORY LOCATION
003446  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
003450  001401                          BEQ     1$                      ;RECEIVED MEMORY CONTENTS
```

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003452
003452  104003                  .IIF IDN    <BA>,<BA>,    HLT   3                    ;BUS ADDRESS MEMORY ERROR
                                        EMT   3
                                .IIF IDN    <BA>,<BC>,    HLT   4                    ;BYTE COUNT MEMORY ERROR
003454  005005                  1$:   CLR   R5                    ;EXPECTED RESULT AFTER CLEAR=0
003456  042777  177777  005656          BIC   #177777,@DHBA       ;CLEAR MEMORY LOCATION
003464  017704  005652                MOV   @DHBA,R4              ;READ CONTENTS OF BUS ADDRESS
                                                                  ;MEMORY ADDRESS 16
003470  001401                        BEQ   2$
003472
003472  104003                  .IIF IDN    <BA>,<BA>,    HLT   3                    ;BUS ADDRESS MEMORY ERROR
                                        EMT   3
                                .IIF IDN    <BA>,<BC>,    HLT   4                    ;BYTE COUNT MEMORY ERROR
                                                                  ;ADDRESS 16 NOT 0, ERROR
003474  104400                  2$:   SCOPE
        000017                  XADRS=XADRS+1
        000017                  XCADRS=XCADRS+1
003476                          MEMT2   ↑/BA/,↑/BUS ADDRESS/,\XADRS,\XCADRS,177777,↑/177777/

                                        ;BUS ADDRESS MEMORY DATA TEST
                                        ;VERIFY THAT ADDRESS 17 OF BUS ADDRESS MEMORY
                                        ;CAN BE SET TO 177777 AND CLEARED TO 0

003476                          TS \XN,100,2$
003476  012767  000340  174272  T22:  MOV   #340,PS               ;DISABLE ALL INTERRUPTS
003504  012767  000100  005670        MOV   #100,ICOUNT           ;SET UP FOR 100 ITERATIONS
003512  012767  003572  005656        MOV   #2$,ESCAPE            ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV   #.,FREEZ1           ;SET UP TO LOOP WITH DATA        ; 3
                                .ENDC
        000023                  XN=XN+1
003520  012705  177777                MOV   #177777,R5            ;EXPECTED RESULT=177777
003524  012777  000017  005602        MOV   #17,@DHSCR            ;SELECT LOCATION 17
                                                                  ;OF BUS ADDRESS MEMORY
003532  012777  177777  005602        MOV   #177777,@DHBA         ;WRITE 177777 INTO MEMORY
003540  017704  005576                MOV   @DHBA,R4              ;READ CONTENTS OF MEMORY LOCATION
003544  020504                        CMP   R5,R4                 ;COMPARE EXPECTED AND
003546  001401                        BEQ   1$                    ;RECEIVED MEMORY CONTENTS
003550                          .IIF IDN    <BA>,<BA>,    HLT   3                    ;BUS ADDRESS MEMORY ERROR
003550  104003                        EMT   3
                                .IIF IDN    <BA>,<BC>,    HLT   4                    ;BYTE COUNT MEMORY ERROR
003552  005005                  1$:   CLR   R5                    ;EXPECTED RESULT AFTER CLEAR=0
003554  042777  177777  005560        BIC   #177777,@DHBA         ;CLEAR MEMORY LOCATION
003562  017704  005554                MOV   @DHBA,R4              ;READ CONTENTS OF BUS ADDRESS
                                                                  ;MEMORY ADDRESS 17
003566  001401                        BEQ   2$
003570
003570  104003                  .IIF IDN    <BA>,<BA>,    HLT   3                    ;BUS ADDRESS MEMORY ERROR
                                        EMT   3
                                .IIF IDN    <BA>,<BC>,    HLT   4                    ;BYTE COUNT MEMORY ERROR
                                                                  ;ADDRESS 17 NOT 0, ERROR
003572  104400                  2$:   SCOPE
        000020                  XADRS=XADRS+1
        000020                  XCADRS=XCADRS+1
18      000000                  XADRS=0
19      000000                  XCADRS=0
20      000000                  ADRS=XADRS
21      000000                  CADRS=XCADRS
23      000020                  .REPT   16.
24                              MEMT2   ↑/BC/,↑/BYTE COUNT/,\XADRS,\XCADRS,177777,↑/177777/
```

```
                                .NLIST
                                XADRS=XADRS+1
                                XCADRS=XCADRS+1
                                .LIST
                                .ENDR
003574                          MEMT2   +/BC/,+/BYTE COUNT/,\XADRS,\XCADRS,177777,+/177777/

                                        ;BYTE COUNT MEMORY DATA TEST
                                        ;VERIFY THAT ADDRESS 0 OF BYTE COUNT MEMORY
                                        ;CAN BE SET TO 177777 AND CLEARED TO 0

003574                          TS \XN,100,2$
003574  012767  000340  174174  T23:    MOV     @340,PS                 ;DISABLE ALL INTERRUPTS
003602  012767  000100  005572          MOV     @100,ICOUNT             ;SET UP FOR 100 ITERATIONS
003610  012767  003670  005560          MOV     @2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     @.FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000024                  XN=XN+1
003616  012705  177777                  MOV     @177777,R5              ;EXPECTED RESULT=177777
003622  012777  000000  005504          MOV     @0,@DHSCR               ;SELECT LOCATION 0
                                                                        ;OF BYTE COUNT MEMORY
003630  012777  177777  005506          MOV     @177777,@DHBC           ;WRITE 177777 INTO MEMORY
003636  017704  005502                  MOV     @DHBC,R4                ;READ CONTENTS OF MEMORY LOCATION
003642  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
003644  001401                          BEQ     1$                      ;RECEIVED MEMORY CONTENTS
                                .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
003646                          .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
003646  104004                          EMT     4
003650  005005                  1$:     CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
003652  042777  177777  005464          BIC     @177777,@DHBC           ;CLEAR MEMORY LOCATION
003660  017704  005460                  MOV     @DHBC,R4                ;READ CONTENTS OF BYTE COUNT
                                                                        ;MEMORY ADDRESS 0
003664  001401                          BEQ     2$
                                .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
003666                          .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
003666  104004                          EMT     4
                                                                        ;ADDRESS 0 NOT 0, ERROR
003670  104400                  2$:     SCOPE
        000001                  XADRS=XADRS+1
        000001                  XCADRS=XCADRS+1
003672                          MEMT2   +/BC/,+/BYTE COUNT/,\XADRS,\XCADRS,177777,+/177777/

                                        ;BYTE COUNT MEMORY DATA TEST
                                        ;VERIFY THAT ADDRESS 1 OF BYTE COUNT MEMORY
                                        ;CAN BE SET TO 177777 AND CLEARED TO 0

003672                          TS \XN,100,2$
003672  012767  000340  174076  T24:    MOV     @340,PS                 ;DISABLE ALL INTERRUPTS
003700  012767  000100  005474          MOV     @100,ICOUNT             ;SET UP FOR 100 ITERATIONS
003706  012767  003766  005462          MOV     @2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     @.FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000025                  XN=XN+1
003714  012705  177777                  MOV     @177777,R5              ;EXPECTED RESULT=177777
003720  012777  000001  005406          MOV     @1,@DHSCR               ;SELECT LOCATION 1
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003726  012777  177777  005410          MOV     #177777,@DHBC           ;OF BYTE COUNT MEMORY
003734  017704  005404                  MOV     @DHBC,R4                ;WRITE 177777 INTO MEMORY
003740  020504                          CMP     R5,R4                   ;READ CONTENTS OF MEMORY LOCATION
003742  001401                          BEQ     1$                      ;COMPARE EXPECTED AND
                                .IIF IDN        <BC>,<BA>,      HLT     ;RECEIVED MEMORY CONTENTS
003744                          .IIF IDN        <BC>,<BC>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
003744  104004                          EMT     4                       4                       ;BYTE COUNT MEMORY ERROR
003746  005005                  1$:     CLR     R5
003750  042777  177777  005366          BIC     #177777,@DHBC           ;EXPECTED RESULT AFTER CLEAR=0
003756  017704  005362                  MOV     @DHBC,R4                ;CLEAR MEMORY LOCATION
                                                                        ;READ CONTENTS OF BYTE COUNT
003762  001401                          BEQ     2$                      ;MEMORY ADDRESS 1
                                .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
003764                          .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
003764  104004                          EMT     4
                                                                        ;ADDRESS 1 NOT 0, ERROR
003766  104400                  2$:     SCOPE
        000002                  XADRS=XADRS+1
        000002                  XCADRS=XCADRS+1
003770                          MEMT2   +/BC/,+/BYTE COUNT/,\XADRS,\XCADRS,177777,+/177777/

                                ;BYTE COUNT MEMORY DATA TEST
                                ;VERIFY THAT ADDRESS 2 OF BYTE COUNT MEMORY
                                ;CAN BE SET TO 177777 AND CLEARED TO 0

003770                          TS \XN,100,2$
003770  012767  000340  174000  T25:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
003776  012767  000100  005376          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
004004  012767  004064  005364          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000026                  XN=XN+1
004012  012705  177777                  MOV     #177777,R5              ;EXPECTED RESULT=177777
004016  012777  000002  005310          MOV     #2,@DHSCR               ;SELECT LOCATION 2
                                                                        ;OF BYTE COUNT MEMORY
004024  012777  177777  005312          MOV     #177777,@DHBC           ;WRITE 177777 INTO MEMORY
004032  017704  005306                  MOV     @DHBC,R4                ;READ CONTENTS OF MEMORY LOCATION
004036  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
004040  001401                          BEQ     1$                      ;RECEIVED MEMORY CONTENTS
                                .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
004042                          .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
004042  104004                          EMT     4
004044  005005                  1$:     CLR     R5
004046  042777  177777  005270          BIC     #177777,@DHBC           ;EXPECTED RESULT AFTER CLEAR=0
004054  017704  005264                  MOV     @DHBC,R4                ;CLEAR MEMORY LOCATION
                                                                        ;READ CONTENTS OF BYTE COUNT
004060  001401                          BEQ     2$                      ;MEMORY ADDRESS 2
                                .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
004062                          .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
004062  104004                          EMT     4
                                                                        ;ADDRESS 2 NOT 0, ERRCR
004064  104400                  2$:     SCOPE
        000003                  XADRS=XADRS+1
        000003                  XCADRS=XCADRS+1
004066                          MEMT2   +/BC/,+/BYTE COUNT/,\XADRS,\XCADRS,177777,+/177777/
```

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                                ;BYTE COUNT MEMORY DATA TEST
                                ;VERIFY THAT ADDRESS 3 OF BYTE COUNT MEMORY
                                ;CAN BE SET TO 177777 AND CLEARED TO 0

004066                          TS \XN,100,2$
004066  012767  000340  173702  T26:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
004074  012767  000100  005300          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
004102  012767  004162  005266          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000027                  XN=XN+1
004110  012705  177777                  MOV     #177777,R5              ;EXPECTED RESULT=177777
004114  012777  000003  005212          MOV     #3,@DHSCR               ;SELECT LOCATION 3
                                                                        ;OF BYTE COUNT MEMORY
004122  012777  177777  005214          MOV     #177777,@DHBC           ;WRITE 177777 INTO MEMORY
004130  017704  005210                  MOV     @DHBC,R4                ;READ CONTENTS OF MEMORY LOCATION
004134  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
004136  001401                          BEQ     1$                      ;RECEIVED MEMORY CONTENTS
                                .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
004140                          .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
004140  104004                          EMT     4
004142  005005                  1$:     CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
004144  042777  177777  005172          BIC     #177777,@DHBC           ;CLEAR MEMORY LOCATION
004152  017704  005166                  MOV     @DHBC,R4                ;READ CONTENTS OF BYTE COUNT
                                                                        ;MEMORY ADDRESS 3
004156  001401                          BEQ     2$
                                .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
004160                          .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
004160  104004                          EMT     4

                                                                        ;ADDRESS 3 NOT 0, ERROR
004162  104400                  2$:     SCOPE
        000004                  XADRS=XADRS+1
        000004                  XCADRS=XCADRS+1
004164                          MEMT2   +/BC/,+/BYTE COUNT/,\XADRS,\XCADRS,177777,+/177777/

                                ;BYTE COUNT MEMORY DATA TEST
                                ;VERIFY THAT ADDRESS 4 OF BYTE COUNT MEMORY
                                ;CAN BE SET TO 177777 AND CLEARED TO 0

004164                          TS \XN,100,2$
004164  012767  000340  173604  T27:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
004172  012767  000100  005202          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
004200  012767  004260  005170          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000030                  XN=XN+1
004206  012705  177777                  MOV     #177777,R5              ;EXPECTED RESULT=177777
004212  012777  000004  005114          MOV     #4,@DHSCR               ;SELECT LOCATION 4
                                                                        ;OF BYTE COUNT MEMORY
004220  012777  177777  005116          MOV     #177777,@DHBC           ;WRITE 177777 INTO MEMORY
004226  017704  005112                  MOV     @DHBC,R4                ;READ CONTENTS OF MEMORY LOCATION
004232  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
004234  001401                          BEQ     1$                      ;RECEIVED MEMORY CONTENTS
                                .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
```

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004236                          .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
004236  104004                          EMT     4
004240  005005                  1$:     CLR     R5                              ;EXPECTED RESULT AFTER CLEAR=0
004242  042777  177777  ^05074         BIC     #177777,@DHBC                   ;CLEAR MEMORY LOCATION
004250  017704  005070                 MOV     @DHBC,R4                        ;READ CONTENTS OF BYTE COUNT
                                                                                ;MEMORY ADDRESS 4
004254  001401                          BEQ     2$
                                .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
004256                          .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
004256  104004                          EMT     4
                                                                                ;ADDRESS 4 NOT 0, ERROR
004260  104400                  2$:     SCOPE
        000005                  XADRS=XADRS+1
        000005                  XCADRS=XCADRS+1
004262                          MEMT2   +/BC/,+/BYTE COUNT/,\XADRS,\XCADRS,177777,+/177777/

                                        ;BYTE COUNT MEMORY DATA TEST
                                        ;VERIFY THAT ADDRESS 5 OF BYTE COUNT MEMORY
                                        ;CAN BE SET TO 177777 AND CLEARED TO 0

004262                          TS \XN,100,2$
004262  012767  000340  173506  T30:    MOV     #340,PS                         ;DISABLE ALL INTERRUPTS
004270  012767  000100  005104          MOV     #100,ICOUNT                     ;SET UP FOR 100 ITERATIONS
004276  012767  004356  005072          MOV     #2$,ESCAPE                      ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                        ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000031                  XN=XN+1
004304  012705  177777                  MOV     #177777,R5                      ;EXPECTED RESULT=177777
004310  012777  000005  005016          MOV     #5,@DHSCR                       ;SELECT LOCATION 5
                                                                                ;OF BYTE COUNT MEMORY
004316  012777  177777  005020          MOV     #177777,@DHBC                   ;WRITE 177777 INTO MEMORY
004324  017704  005014                  MOV     @DHBC,R4                        ;READ CONTENTS OF MEMORY LOCATION
004330  020504                          CMP     R5,R4                           ;COMPARE EXPECTED AND
004332  001401                          BEQ     1$                              ;RECEIVED MEMORY CONTENTS
                                .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
004334                          .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
004334  104004                          EMT     4
004336  005005                  1$:     CLR     R5                              ;EXPECTED RESULT AFTER CLEAR=0
004340  042777  177777  004776         BIC     #177777,@DHBC                   ;CLEAR MEMORY LOCATION
004346  017704  004772                 MOV     @DHBC,R4                        ;READ CONTENTS OF BYTE COUNT
                                                                                ;MEMORY ADDRESS 5
004352  001401                          BEQ     2$
                                .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
004354                          .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
004354  104004                          EMT     4
                                                                                ;ADDRESS 5 NOT 0, ERROR
004356  104400                  2$:     SCOPE
        000006                  XADRS=XADRS+1
        000006                  XCADRS=XCADRS+1
004360                          MEMT2   +/BC/,+/BYTE COUNT/,\XADRS,\XCADRS,177777,+/177777/

                                        ;BYTE COUNT MEMORY DATA TEST
                                        ;VERIFY THAT ADDRESS 6 OF BYTE COUNT MEMORY
                                        ;CAN BE SET TO 177777 AND CLEARED TO 0

004360                          TS \XN,100,2$
```

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004360  012767  000340  173410  T31:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
004366  012767  000100  005006          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
004374  012767  004454  004774          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000032                  XN=XN+1
004402  012705  177777                  MOV     #177777,R5              ;EXPECTED RESULT=177777
004406  012777  000006  004720          MOV     #6,@DHSCR               ;SELECT LOCATION 6
                                                                        ;OF BYTE COUNT MEMORY
004414  012777  177777  004722          MOV     #177777,@DHBC           ;WRITE 177777 INTO MEMORY
004422  017704  004716                  MOV     @DHBC,R4                ;READ CONTENTS OF MEMORY LOCATION
004426  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
004430  001401                          BEQ     1$                      ;RECEIVED MEMORY CONTENTS
                                .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
004432
                                .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
004432  104004                          EMT     4
004434  005005                  1$:     CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
004436  042777  177777  004700          BIC     #177777,@DHBC           ;CLEAR MEMORY LOCATION
004444  017704  004674                  MOV     @DHBC,R4                ;READ CONTENTS OF BYTE COUNT
                                                                        ;MEMORY ADDRESS 6
004450  001401                          BEQ     2$
                                .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
0C4452
                                .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
004452  104004                          EMT     4
                                                                        ;ADDRESS 6 NOT 0, ERROR
004454  104400                  2$:     SCOPE
        000007                  XADRS=XADRS+1
        000007                  XCADRS=XCADRS+1
004456                          MEMT2   ^/BC/,^/BYTE COUNT/,\XADRS,\XCADRS,177777,^/177777/

                                ;BYTE COUNT MEMORY DATA TEST
                                ;VERIFY THAT ADDRESS 7 OF BYTE COUNT MEMORY
                                ;CAN BE SET TO 177777 AND CLEARED TO 0

004456                          TS \XN,100,2$
004456  012767  000340  173312  T32:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
004464  012767  000100  004710          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
004472  012767  004552  004676          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000033                  XN=XN+1
004500  012705  177777                  MOV     #177777,R5              ;EXPECTED RESULT=177777
004504  012777  000007  004622          MOV     #7,@DHSCR               ;SELECT LOCATION 7
                                                                        ;OF BYTE COUNT MEMORY
004512  012777  177777  004624          MOV     #177777,@DHBC           ;WRITE 177777 INTO MEMORY
004520  017704  004620                  MOV     @DHBC,R4                ;READ CONTENTS OF MEMORY LOCATION
004524  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
004526  001401                          BEQ     1$                      ;RECEIVED MEMORY CONTENTS
                                .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
004530
                                .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
004530  104004                          EMT     4
004532  005005                  1$:     CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
004534  042777  177777  004602          BIC     #177777,@DHBC           ;CLEAR MEMORY LOCATION
004542  017704  004576                  MOV     @DHBC,R4                ;READ CONTENTS OF BYTE COUNT
                                                                        ;MEMORY ADDRESS 7
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004546  001401                          BEQ     2$
                                .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
004550                          .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
004550  104004                          EMT     4
                                                                        ;ADDRESS 7 NOT 0, ERROR
004552  104400                  2$:     SCOPE
        000010                  XADRS=XADRS+1
        000010                  XCADRS=XCADRS+1
004554                          MEMT2   ^/BC/,^/BYTE COUNT/,\XADRS,\XCADRS,177777,^/177777/

                                        ;BYTE COUNT MEMORY DATA TEST
                                        ;VERIFY THAT ADDRESS 10 OF BYTE COUNT MEMORY
                                        ;CAN BE SET TO 177777 AND CLEARED TO 0

004554                          TS \XN,100,2$
004554  012767  000340  173214  T33:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
004562  012767  000100  004612          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
004570  012767  004650  004600          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000034                  XN=XN+1
004576  012705  177777                  MOV     #177777,R5              ;EXPECTED RESULT=177777
0C4602  012777  000010  004524          MOV     #10,@DHSCR              ;SELECT LOCATION 10
                                                                        ;OF BYTE COUNT MEMORY
004610  012777  177777  004526          MOV     #177777,@DHBC           ;WRITE 177777 INTO MEMORY
004616  017704  004522                  MOV     @DHBC,R4                ;READ CONTENTS OF MEMORY LOCATION
004622  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
004624  001401                          BEQ     1$                      ;RECEIVED MEMORY CONTENTS
                                .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
004626                          .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
004626  104004                          EMT     4
004630  005005                  1$:     CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
004632  042777  177777  004504          BIC     #177777,@DHBC           ;CLEAR MEMORY LOCATION
004640  017704  004500                  MOV     @DHBC,R4                ;READ CONTENTS OF BYTE COUNT
                                                                        ;MEMORY ADDRESS 10
004644  001401                          BEQ     2$
                                .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
004646                          .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
004646  104004                          EMT     4
                                                                        ;ADDRESS 10 NOT 0, ERROR
004650  104400                  2$:     SCOPE
        000011                  XADRS=XADRS+1
        000011                  XCADRS=XCADRS+1
004652                          MEMT2   ^/BC/,^/BYTE COUNT/,\XADRS,\XCADRS,177777,^/177777/

                                        ;BYTE COUNT MEMORY DATA TEST
                                        ;VERIFY THAT ADDRESS 11 OF BYTE COUNT MEMORY
                                        ;CAN BE SET TO 177777 AND CLEARED TO 0

004652                          TS \XN,100,2$
004652  012767  000340  173116  T34:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
004660  012767  000100  004514          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
004666  012767  004746  004502          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
```

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                000035                  XN=XN+1
004674  012705  177777                          MOV     #177777,R5              ;EXPECTED RESULT=177777
004700  012777  000011  004426                  MOV     #11,@DHSCR              ;SELECT LOCATION 11
                                                                                ;OF BYTE COUNT MEMORY
004706  012777  177777  004430                  MOV     #177777,@DHBC           ;WRITE 177777 INTO MEMORY
004714  017704  004424                          MOV     @DHBC,R4                ;READ CONTENTS OF MEMORY LOCATION
004720  020504                                  CMP     R5,R4                   ;COMPARE EXPECTED AND
004722  001401                                  BEQ     1$                      ;RECEIVED MEMORY CONTENTS
                                        .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
004724                                  .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
004724  104004                                  EMT     4
004726  005005                          1$:     CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
004730  042777  177777  004406                  BIC     #177777,@DHBC           ;CLEAR MEMORY LOCATION
004736  017704  004402                          MOV     @DHBC,R4                ;READ CONTENTS OF BYTE COUNT
                                                                                ;MEMORY ADDRESS 11
004742  001401                                  BEQ     2$
                                        .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
004744                                  .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
004744  104004                                  EMT     4
                                                                                ;ADDRESS 11 NOT 0, ERROR
004746  104400                          2$:     SCOPE
                000012                  XADRS=XADRS+1
                000012                  XCADRS=XCADRS+1
0C4750                                  MEMT2   +/BC/,+/BYTE COUNT/,\XADRS,\XCADRS,177777,+/177777/

                                                ;BYTE COUNT MEMORY DATA TEST
                                                ;VERIFY THAT ADDRESS 12 OF BYTE COUNT MEMORY
                                                ;CAN BE SET TO 177777 AND CLEARED TO 0

004750                                  TS \XN,100,2$
004750  012767  000340  173020          T35:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
004756  012767  000100  004416                  MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
004764  012767  005044  004404                  MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                        .IF NB  <>
                                                MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                        .ENDC
                000036                  XN=XN-1
004772  012705  177777                          MOV     #177777,R5              ;EXPECTED RESULT=177777
004776  012777  000012  004330                  MOV     #12,@DHSCR              ;SELECT LOCATION 12
                                                                                ;OF BYTE COUNT MEMORY
005004  012777  177777  004332                  MOV     #177777,@DHBC           ;WRITE 177777 INTO MEMORY
005012  017704  004326                          MOV     @DHBC,R4                ;READ CONTENTS OF MEMORY LOCATION
005016  020504                                  CMP     R5,R4                   ;COMPARE EXPECTED AND
005020  001401                                  BEQ     1$                      ;RECEIVED MEMORY CONTENTS
                                        .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
005022                                  .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
005022  104004                                  EMT     4
005024  005005                          1$:     CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
005026  042777  177777  004310                  BIC     #177777,@DHBC           ;CLEAR MEMORY LOCATION
005034  017704  004304                          MOV     @DHBC,R4                ;READ CONTENTS OF BYTE COUNT
                                                                                ;MEMORY ADDRESS 12
005040  001401                                  BEQ     2$
                                        .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
005042                                  .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
005042  104004                                  EMT     4
                                                                                ;ADDRESS 12 NOT 0, ERROR
005044  104400                          2$:     SCOPE
```

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                000013                  XADRS=XADRS+1
                000013                  XCADRS=XCADRS+1
005046                                  MEMT2   ↑/BC/,↑/BYTE COUNT/,\XADRS,\XCADRS,177777,↑/177777/

                                                ;BYTE COUNT MEMORY DATA TEST
                                                ;VERIFY THAT ADDRESS 13 OF BYTE COUNT MEMORY
                                                ;CAN BE SET TO 177777 AND CLEARED TO 0

005046                                  TS \XN,100,2$
005046  012767  000340  172722          T36:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
005054  012767  000100  004320                  MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
005062  012767  005142  004306                  MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                        .IF NB  <>
                                                MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                        .ENDC
                000037                  XN=XN+1
005070  012705  177777                          MOV     #177777,R5              ;EXPECTED RESULT=177777
005074  012777  000013  004232                  MOV     #13,@DHSCR              ;SELECT LOCATION 13
                                                                                ;OF BYTE COUNT MEMORY
005102  012777  177777  004234                  MOV     #177777,@DHBC           ;WRITE 177777 INTO MEMORY
005110  017704  004230                          MOV     @DHBC,R4                ;READ CONTENTS OF MEMORY LOCATION
005114  020504                                  CMP     R5,R4                   ;COMPARE EXPECTED AND
005116  001401                                  BEQ     1$                      ;RECEIVED MEMORY CONTENTS
                                        .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
005120                                  .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
005120  104004                                  EMT     4
005122  005005                          1$:     CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
005124  042777  177777  004212                  BIC     #177777,@DHBC           ;CLEAR MEMORY LOCATION
005132  017704  004206                          MOV     @DHBC,R4                ;READ CONTENTS OF BYTE COUNT
                                                                                ;MEMORY ADDRESS 13
005136  001401                                  BEQ     2$
                                        .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
005140                                  .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
005140  104004                                  EMT     4

                                                                                ;ADDRESS 13 NOT 0, ERROR
005142  104400                          2$:     SCOPE
                000014                  XADRS=XADRS+1
                000014                  XCADRS=XCADRS+1
005144                                  MEMT2   ↑/BC/,↑/BYTE COUNT/,\XADRS,\XCADRS,177777,↑/177777/

                                                ;BYTE COUNT MEMORY DATA TEST
                                                ;VERIFY THAT ADDRESS 14 OF BYTE COUNT MEMORY
                                                ;CAN BE SET TO 177777 AND CLEARED TO 0

005144                                  TS \XN,100,2$
005144  012767  000340  172624          T37:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
005152  012767  000100  004222                  MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
005160  012767  005240  004210                  MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                        .IF NB  <>
                                                MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                        .ENDC
                000040                  XN=XN+1
005166  012705  177777                          MOV     #177777,R5              ;EXPECTED RESULT=177777
005172  012777  000014  004134                  MOV     #14,@DHSCR              ;SELECT LOCATION 14
                                                                                ;OF BYTE COUNT MEMORY
005200  012777  177777  004136                  MOV     #177777,@DHBC           ;WRITE 177777 INTO MEMORY
005206  017704  004132                          MOV     @DHBC,R4                ;READ CONTENTS OF MEMORY LOCATION
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005212  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
005214  001401                          BEQ     1$                      ;RECEIVED MEMORY CONTENTS
                                .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
005216                          .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
005216  104004                          EMT     4
005220  005005                  1$:     CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
005222  042777  177777  004114          BIC     #177777,@DHBC           ;CLEAR MEMORY LOCATION
005230  017704  004110                  MOV     @DHBC,R4                ;READ CONTENTS OF BYTE COUNT
                                                                        ;MEMORY ADDRESS 14
005234  001401                          BEQ     2$
                                .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
005236                          .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
005236  104004                          EMT     4
                                                                        ;ADDRESS 14 NOT 0, ERROR
005240  104400                  2$:     SCOPE
        000015                  XADRS=XADRS+1
        000015                  XCADRS=XCADRS+1
005242                          MEMT2   ↑/BC/,↑/BYTE COUNT/,\XADRS,\XCADRS,177777,↑/177777/

                                        ;BYTE COUNT MEMORY DATA TEST
                                        ;VERIFY THAT ADDRESS 15 OF BYTE COUNT MEMORY
                                        ;CAN BE SET TO 177777 AND CLEARED TO 0

005242                          TS \XN,100,2$
005242  012767  000340  172526  T40:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
005250  012767  000100  004124          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
005256  012767  005336  004112          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000041                  XN=XN+1
005264  012705  177777                  MOV     #177777,R5              ;EXPECTED RESULT=177777
005270  012777  000015  004036          MOV     #15,@DHSCR              ;SELECT LOCATION 15
                                                                        ;OF BYTE COUNT MEMORY
005276  012777  177777  004040          MOV     #177777,@DHBC           ;WRITE 177777 INTO MEMORY
005304  017704  004034                  MOV     @DHBC,R4                ;READ CONTENTS OF MEMORY LOCATION
005310  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
005312  001401                          BEQ     1$                      ;RECEIVED MEMORY CONTENTS
                                .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
005314                          .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
005314  104004                          EMT     4
005316  005005                  1$:     CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
005320  042777  177777  004016          BIC     #177777,@DHBC           ;CLEAR MEMORY LOCATION
005326  017704  004012                  MOV     @DHBC,R4                ;READ CONTENTS OF BYTE COUNT
                                                                        ;MEMORY ADDRESS 15
005332  001401                          BEQ     2$
                                .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
005334                          .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
005334  104004                          EMT     4
                                                                        ;ADDRESS 15 NOT 0, ERROR
005336  104400                  2$:     SCOPE
        000016                  XADRS=XADRS+1
        000016                  XCADRS=XCADRS+1
005340                          MEMT2   ↑/BC/,↑/BYTE COUNT/,\XADRS,\XCADRS,177777,↑/177777/

                                        ;BYTE COUNT MEMORY DATA TEST
                                        ;VERIFY THAT ADDRESS 16 OF BYTE COUNT MEMORY
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                                        ;CAN BE SET TO 177777 AND CLEARED TO 0

 005340                                 TS \XN,100,2$
 005340  012767  000340  172430  T41:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
 005346  012767  000100  004026          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
 005354  012767  005434  004014          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                        .IF NB  <>
                                          MOV     #,FREEZ1              ;SET UP TO LOOP WITH DATA       ; 3
                                        .ENDC
         000042                         XN=XN+1
 005362  012705  177777                  MOV     #177777,R5              ;EXPECTED RESULT=177777
 005366  012777  000016  003740          MOV     #16,@DHSCR              ;SELECT LOCATION 16
                                                                         ;OF BYTE COUNT MEMORY
 005374  012777  177777  003742          MOV     #177777,@DHBC           ;WRITE 177777 INTO MEMORY
 005402  017704  003736                  MOV     @DHBC,R4                ;READ CONTENTS OF MEMORY LOCATION
 005406  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
 005410  001401                          BEQ     1$                      ;RECEIVED MEMORY CONTENTS
                                        .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
 005412                                 .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
 005412  104004                          EMT     4
 005414  005005                 1$:      CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
 005416  042777  177777  003720          BIC     #177777,@DHBC           ;CLEAR MEMORY LOCATION
 005424  017704  003714                  MOV     @DHBC,R4                ;READ CONTENTS OF BYTE COUNT
                                                                         ;MEMORY ADDRESS 16
 005430  001401                          BEQ     2$
                                        .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
 005432                                 .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
 005432  104004                          EMT     4
                                                                         ;ADDRESS 16 NOT 0, ERROR
 005434  104400                 2$:      SCOPE
         000017                         XADRS=XADRS+1
         000017                         XCADRS=XCADRS+1
 005436                                 MEMT2   +/BC/,+/BYTE COUNT/,\XADRS,\XCADRS,177777,+/177777/

                                        ;BYTE COUNT MEMORY DATA TEST
                                        ;VERIFY THAT ADDRESS 17 OF BYTE COUNT MEMORY
                                        ;CAN BE SET TO 177777 AND CLEARED TO 0

 005436                                 TS \XN,100,2$
 005436  012767  000340  172332  T42:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
 005444  012767  000100  003730          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
 005452  012767  005532  003716          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                        .IF NB  <>
                                          MOV     #,FREEZ1              ;SET UP TO LOOP WITH DATA       ; 3
                                        .ENDC
         000043                         XN=XN+1
 005460  012705  177777                  MOV     #177777,R5              ;EXPECTED RESULT=177777
 005464  012777  000017  003642          MOV     #17,@DHSCR              ;SELECT LOCATION 17
                                                                         ;OF BYTE COUNT MEMORY
 005472  012777  177777  003644          MOV     #177777,@DHBC           ;WRITE 177777 INTO MEMORY
 005500  017704  003640                  MOV     @DHBC,R4                ;READ CONTENTS OF MEMORY LOCATION
 005504  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
 005506  001401                          BEQ     1$                      ;RECEIVED MEMORY CONTENTS
                                        .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
 005510                                 .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
 005510  104004                          EMT     4
 005512  005005                 1$:      CLR     R5                      ;EXPECTED RESULT AFTER CLEAR=0
```

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005514  042777  177777  003622          BIC     #177777,@DHBC           ;CLEAR MEMORY LOCATION
005522  017704  003616                  MOV     @DHBC,R4                ;READ CONTENTS OF BYTE COUNT
                                                                        ;MEMORY ADDRESS 17
005526  001401                          BEQ     2$
                                .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
005530
005530  104004                  .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
                                        EMT     4
005532  104400                                                          ;ADDRESS 17 NOT 0, ERROR
        000020          2$:     SCOPE
                        XADRS=XADRS+1
        000020          XCADRS=XCADRS+1
 30 005534              MEMT3   ↑/BA/,↑/BUS ADDRESS/,177777,↑/177777/

                                ;BUS ADDRESS MEMORY TEST
                                ;CLEAR ALL LOCATIONS IN BUS ADDRESS MEMORY
                                ;SET SELECTED LOCATION TO VALUE 177777
                                ;VERIFY THAT SELECTED LOCATION WAS SET
                                ;TO 177777.
                                ;VERIFY THAT NO OTHER LOCATION WAS MODIFIED.

005534                          TS \XN,100,6$,2$
005534  012767  000340  172234  T43:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
005542  012767  000100  003632          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
005550  012767  005706  003620          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                        .IF NB  <2$>
005556  012767  005602  003614          MOV     #2$,FREEZ1              ;SET UP TO LOOP WITH DATA       ; 3
                        .ENDC
        000044          XN=XN+1
005564  012700  000020                  MOV     #20,R0                  ;SET UP TO TEST 20(OCTAL)
                                                                        ;LOCATIONS IN BUS ADDRESS MEMORY
005570  005003                          CLR     R3                      ;FIRST LOCATION TO BE
                                                                        ;WRITTEN INTO IS 0
005572  012701  000020          1$:     MOV     #20,R1                  ;SET UP TO CLEAR 20 (OCTAL)
                                                                        ;LOCATIONS IN BUS ADDRESS MEMORY
005576  005077  003532                  CLR     @DHSCR                  ;START AT LOCATION 0
005602  005077  003534          2$:     CLR     @DHBA                   ;CLEAR LOCATION IN
                                                                        ;BUS ADDRESS MEMORY
005606  005277  003522                  INC     @DHSCR                  ;ADVANCE TO NEXT LOCATION
005612  005301                          DEC     R1                      ;CONTINUE CLEARING
005614  001372                          BNE     2$                      ;IF NOT DONE
005616  010377  003512                  MOV     R3,@DHSCR               ;SELECT ADDRESS TO BE TESTED
005622  012777  177777  003512          MOV     #177777,@DHBA           ;WRITE 177777 INTO LOCATION
005630  005077  003500                  CLR     @DHSCR                  ;ADDRESS LOCATION 0
005634  012701  000020                  MOV     #20,R1                  ;SET UP TO CHECK ALL ADDRESSES
                                                                        ;IN BUS ADDRESS MEMORY
005640  012705  177777          3$:     MOV     #177777,R5              ;177777=EXPECTED RESULT
                                                                        ;IF ADDRESS READ IS LOCATION
                                                                        ;WRITTEN INTO
005644  017704  003472                  MOV     @DHBA,R4                ;READ MEMORY LOCATION
005650  027703  003460                  CMP     @DHSCR,R3               ;IF LINE NUMBER=ADDRESS
                                                                        ;OF LOCATION WRITTEN INTO
                                                                        ;EXPECTED CONTENTS=177777
005654  001401                          BEQ     4$
005656  005005                          CLR     R5                      ;OTHERWISE, EXPECTED RESULTS=0
005660  020504          4$:     CMP     R5,R4                           ;DOES MEMORY LOCATION CONTAIN
005662  001401                  BEQ     5$                              ;EXPECTED RESULT
005664                  .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
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                005664  104003                  EMT     3
                                        .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
                005666  104410          5$:     SCOPE1                          ;CHECK FOR LOOP WITH CURRENT DATA
                005670  005277  003440          INC     @DHSCR                  ;CHECK CONTENTS OF NEXT LOCATION
                005674  005301                  DEC     R1
                005676  001360                  BNE     3$
                005700  005203                  INC     R3                      ;NEXT ADDRESS TO BE WRITTEN
                005702  005300                  DEC     R0
                005704  001332                  BNE     1$
                005706  104400          6$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
             31 005710                  MEMT3   ↑/BA/,↑/BUS ADDRESS/,125252,↑/125252/

                                                ;BUS ADDRESS MEMORY TEST
                                                ;CLEAR ALL LOCATIONS IN BUS ADDRESS MEMORY
                                                ;SET SELECTED LOCATION TO VALUE 125252
                                                ;VERIFY THAT SELECTED LOCATION WAS SET
                                                ;TO 125252.
                                                ;VERIFY THAT NO OTHER LOCATION WAS MODIFIED.

                005710                  TS \XN,100,6$,2$
                005710  012767  000340  172060  T44:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
                005716  012767  000100  003456          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
                005724  012767  006062  003444          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                        .IF NB  <2$>
                005732  012767  005756  003440          MOV     #2$,FREEZ1              ;SET UP TO LOOP WITH DATA       ; 3
                                        .ENDC
                        000045                  XN=XN+1
                005740  012700  000020          MOV     #20,R0                  ;SET UP TO TEST 20(OCTAL)
                                                                                ;LOCATIONS IN BUS ADDRESS MEMORY
                005744  005003                  CLR     R3                      ;FIRST LOCATION TO BE
                                                                                ;WRITTEN INTO IS 0
                005746  012701  000020  1$:     MOV     #20,R1                  ;SET UP TO CLEAR 20 (OCTAL)
                                                                                ;LOCATIONS IN BUS ADDRESS MEMORY
                005752  005077  003356          CLR     @DHSCR                  ;START AT LOCATION 0
                005756  005077  003360  2$:     CLR     @DHBA                   ;CLEAR LOCATION IN
                                                                                ;BUS ADDRESS MEMORY
                005762  005277  003346          INC     @DHSCR                  ;ADVANCE TO NEXT LOCATION
                005766  005301                  DEC     R1                      ;CONTINUE CLEARING
                005770  001372                  BNE     2$                      ;IF NOT DONE
                005772  010377  003336          MOV     R3,@DHSCR               ;SELECT ADDRESS TO BE TESTED
                005776  012777  125252  003336  MOV     #125252,@DHBA           ;WRITE 125252 INTO LOCATION
                006004  005077  003324          CLR     @DHSCR                  ;ADDRESS LOCATION 0
                006010  012701  000020          MOV     #20,R1                  ;SET UP TO CHECK ALL ADDRESSES
                                                                                ;IN BUS ADDRESS MEMORY
                006014  012705  125252  3$:     MOV     #125252,R5              ;125252=EXPECTED RESULT
                                                                                ;IF ADDRESS READ IS LOCATION
                                                                                ;WRITTEN INTO
                006020  017704  003316          MOV     @DHBA,R4                ;READ MEMORY LOCATION
                006024  027703  003304          CMP     @DHSCR,R3               ;IF LINE NUMBER=ADDRESS
                                                                                ;OF LOCATION WRITTEN INTO
                                                                                ;EXPECTED CONTENTS=125252
                006030  001401                  BEQ     4$
                006032  005005                  CLR     R5                      ;OTHERWISE, EXPECTED RESULTS=0
                006034  020504          4$:     CMP     R5,R4                   ;DOES MEMORY LOCATION CONTAIN
                006036  001401                  BEQ     5$                      ;EXPECTED RESULT
                006040                  .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
                006040  104003                  EMT     3
```

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                                .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
 00 ,042  104410                5$:     SCOPE1                          ;CHECK FOR LOOP WITH CURRENT DATA
 006044   005277  003264                INC     @DHSCR                  ;CHECK CONTENTS OF NEXT LOCATION
 006050   005301                        DEC     R1
 006052   001360                        BNE     3$
 006054   005203                        INC     R3                      ;NEXT ADDRESS TO BE WRITTEN
 006056   005300                        DEC     R0
 006060   001332                        BNE     1$
 006062   104400                6$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
32 006064                       MEMT3   ^/BA/,^/BUS ADDRESS/,52525,^/52525/

                                ;BUS ADDRESS MEMORY TEST
                                ;CLEAR ALL LOCATIONS IN BUS ADDRESS MEMORY
                                ;SET SELECTED LOCATION TO VALUE 52525
                                ;VERIFY THAT SELECTED LOCATION WAS SET
                                ;TO 52525.
                                ;VERIFY THAT NO OTHER LOCATION WAS MODIFIED.

 006064                         TS \XN,100,6$,2$
 006064   012767  000340  171704 T45:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
 006072   012767  000100  003302        MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
 006100   012767  006236  003270        MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <2$>
 006106   012767  006132  003264        MOV     #2$,FREEZ1              ;SET UP TO LOOP WITH DATA       ; 3
          000046                .ENDC
                                XN=XN+1
 006114   012700  000020                MOV     #20,R0                  ;SET UP TO TEST 20(OCTAL)
                                                                        ;LOCATIONS IN BUS ADDRESS MEMORY
 006120   005003                        CLR     R3                      ;FIRST LOCATION TO BE
                                                                        ;WRITTEN INTO IS 0
 006122   012701  000020        1$:     MOV     #20,R1                  ;SET UP TO CLEAR 20 (OCTAL)
                                                                        ;LOCATIONS IN BUS ADDRESS MEMORY
 006126   005077  003202                CLR     @DHSCR                  ;START AT LOCATION 0
 006132   005077  003204        2$:     CLR     @DHBA                   ;CLEAR LOCATION IN
                                                                        ;BUS ADDRESS MEMORY
 006136   005277  003172                INC     @DHSCR                  ;ADVANCE TO NEXT LOCATION
 006142   005301                        DEC     R1                      ;CONTINUE CLEARING
 006144   001372                        BNE     2$                      ;IF NOT DONE
 006146   010377  003162                MOV     R3,@DHSCR               ;SELECT ADDRESS TO BE TESTED
 006152   012777  052525  003162        MOV     #52525,@DHBA            ;WRITE 52525 INTO LOCATION
 006160   005077  003150                CLR     @DHSCR                  ;ADDRESS LOCATION 0
 006164   012701  000020                MOV     #20,R1                  ;SET UP TO CHECK ALL ADDRESSES
                                                                        ;IN BUS ADDRESS MEMORY
 006170   012705  052525        3$:     MOV     #52525,R5               ;52525=EXPECTED RESULT
                                                                        ;IF ADDRESS READ IS LOCATION
                                                                        ;WRITTEN INTO
 006174   017704  003142                MOV     @DHBA,R4                ;READ MEMORY LOCATION
 006200   027703  003130                CMP     @DHSCR,R3               ;IF LINE NUMBER=ADDRESS
                                                                        ;OF LOCATION WRITTEN INTO
                                                                        ;EXPECTED CONTENTS=52525
 006204   001401                        BEQ     4$
 006206   005005                        CLR     R5                      ;OTHERWISE, EXPECTED RESULTS=0
 006210   020504        4$:     CMP     R5,R4                           ;DOES MEMORY LOCATION CONTAIN
 006212   001401                BEQ     5$                              ;EXPECTED RESULT
 006214                         .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
 006214   104003                        EMT     3
                                .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
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006216  104410                  5$:     SCOPE1                          ;CHECK FOR LOOP WITH CURRENT DATA
006220  005277  003110                  INC     @DHSCR                  ;CHECK CONTENTS OF NEXT LOCATION
006224  005301                          DEC     R1
006226  001360                          BNE     3$
006230  005203                          INC     R3                      ;NEXT ADDRESS TO BE WRITTEN
006232  005300                          DEC     R0
006234  001332                          BNE     1$
006236  104400                  6$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
 33 006240                      MEMT3   +/BC/,+/BYTE COUNT/,177777,+/177777/

                                        ;BYTE COUNT MEMORY TEST
                                        ;CLEAR ALL LOCATIONS IN BYTE COUNT MEMORY
                                        ;SET SELECTED LOCATION TO VALUE 177777
                                        ;VERIFY THAT SELECTED LOCATION WAS SET
                                        ;TO 177777.
                                        ;VERIFY THAT NO OTHER LOCATION WAS MODIFIED.

006240                          TS \XN,100,6$,2$
006240  012767  000340  171530  T46:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
006246  012767  000100  003126          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
006254  012767  006412  003114          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <2$>
006262  012767  006306  003110          MOV     #2$,FREE71              ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000047                  XN=XN+1
006270  012700  000020                  MOV     #20,R0                  ;SET UP TO TEST 20(OCTAL)
                                                                        ;LOCATIONS IN BYTE COUNT MEMORY
006274  005003                          CLR     R3                      ;FIRST LOCATION TO BE
                                                                        ;WRITTEN INTO IS 0
006276  012701  000020          1$:     MOV     #20,R1                  ;SET UP TO CLEAR 20 (OCTAL)
                                                                        ;LOCATIONS IN BYTE COUNT MEMORY
006302  005077  003026                  CLR     @DHSCR                  ;START AT LOCATION 0
006306  005077  003032          2$:     CLR     @DHBC                   ;CLEAR LOCATION IN
                                                                        ;BYTE COUNT MEMORY
006312  005277  003010                  INC     @DHSCR                  ;ADVANCE TO NEXT LOCATION
006316  005301                          DEC     R1                      ;CONTINUE CLEARING
006320  001372                          BNE     2$                      ;IF NOT DONE
006322  010377  003006                  MOV     R3,@DHSCR               ;SELECT ADDRESS TO BE TESTED
006326  012777  177777  003010          MOV     #177777,@DHBC           ;WRITE 177777 INTO LOCATION
006334  005077  002774                  CLR     @DHSCR                  ;ADDRESS LOCATION 0
006340  012701  000020                  MOV     #20,R1                  ;SET UP TO CHECK ALL ADDRESSES
                                                                        ;IN BYTE COUNT MEMORY
006344  012705  177777          3$:     MOV     #177777,R5              ;177777=EXPECTED RESULT
                                                                        ;IF ADDRESS READ IS LOCATION
                                                                        ;WRITTEN INTO
006350  017704  002770                  MOV     @DHBC,R4                ;READ MEMORY LOCATION
006354  027703  002754                  CMP     @DHSCR,R3               ;IF LINE NUMBER=ADDRESS
                                                                        ;OF LOCATION WRITTEN INTO
                                                                        ;EXPECTED CONTENTS=177777
006360  001401                          BEQ     4$
006362  005005                          CLR     R5                      ;OTHERWISE, EXPECTED RESULTS=0
006364  020504          4$:     CMP     R5,R4                           ;DOES MEMORY LOCATION CONTAIN
006366  001401                  BEQ     5$                              ;EXPECTED RESULT
                                .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
006370                          .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
006370  104004                          EMT     4
006372  104410          5$:     SCOPE1                                  ;CHECK FOR LOOP WITH CURRENT DATA
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006374  005277  002734          INC     @DHSCR                  ;CHECK CONTENTS OF NEXT LOCATION
006400  005301                  DEC     R1
006402  001360                  BNE     3$
006404  005203                  INC     R3                      ;NEXT ADDRESS TO BE WRITTEN
006406  005300                  DEC     R0
006410  001332                  BNE     1$
006412  104400          6$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
 34 006414              MEMT3   ↑/BC/,↑/BYTE COUNT/,125252,↑/125252/

                                ;BYTE COUNT MEMORY TEST
                                ;CLEAR ALL LOCATIONS IN BYTE COUNT MEMORY
                                ;SET SELECTED LOCATION TO VALUE 125252
                                ;VERIFY THAT SELECTED LOCATION WAS SET
                                ;TO 125252.
                                ;VERIFY THAT NO OTHER LOCATION WAS MODIFIED.

006414                  TS \XN,100,6$,2$
006414  012767  000340  171354  T47:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
006422  012767  000100  002752          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
006430  012767  006566  002740          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                        .IF NB  <2$>
006436  012767  006462  002734          MOV     #2$,FREEZ1              ;SET UP TO LOOP WITH DATA       ; 3
                        .ENDC
        000050                  XN=XN+1
006444  012700  000020          MOV     #20,R0                  ;SET UP TO TEST 20(OCTAL)
                                                                ;LOCATIONS IN BYTE COUNT MEMORY
006450  005003                  CLR     R3                      ;FIRST LOCATION TO BE
                                                                ;WRITTEN INTO IS 0
006452  012701  000020  1$:     MOV     #20,R1                  ;SET UP TO CLEAR 20 (OCTAL)
                                                                ;LOCATIONS IN BYTE COUNT MEMORY
006456  005077  002652          CLR     @DHSCR                  ;START AT LOCATION 0
006462  005077  002656  2$:     CLR     @DHBC                   ;CLEAR LOCATION IN
                                                                ;BYTE COUNT MEMORY
006466  005277  002642          INC     @DHSCR                  ;ADVANCE TO NEXT LOCATION
006472  005301                  DEC     R1                      ;CONTINUE CLEARING
006474  001372                  BNE     2$                      ;IF NOT DONE
006476  010377  002632          MOV     R3,@DHSCR               ;SELECT ADDRESS TO BE TESTED
006502  012777  125252  002634  MOV     #125252,@DHBC           ;WRITE 125252 INTO LOCATION
006510  005077  002620          CLR     @DHSCR                  ;ADDRESS LOCATION 0
006514  012701  000020          MOV     #20,R1                  ;SET UP TO CHECK ALL ADDRESSES
                                                                ;IN BYTE COUNT MEMORY
006520  012705  125252  3$:     MOV     #125252,R5              ;125252=EXPECTED RESULT
                                                                ;IF ADDRESS READ IS LOCATION
                                                                ;WRITTEN INTO
006524  017704  002614          MOV     @DHBC,R4                ;READ MEMORY LOCATION
006530  027703  002600          CMP     @DHSCR,R3               ;IF LINE NUMBER=ADDRESS
                                                                ;OF LOCATION WRITTEN INTO
                                                                ;EXPECTED CONTENTS=125252
006534  001401                  BEQ     4$
006536  005005                  CLR     R5                      ;OTHERWISE, EXPECTED RESULTS=0
006540  020504          4$:     CMP     R5,R4                   ;DOES MEMORY LOCATION CONTAIN
006542  001401                  BEQ     5$                      ;EXPECTED RESULT
                        .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
006544                  .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
006544  104004                  EMT     4
006546  104410          5$:     SCOPE1                          ;CHECK FOR LOOP WITH CURRENT DATA
006550  005277  002560          INC     @DHSCR                  ;CHECK CONTENTS OF NEXT LOCATION
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006554  005301                  DEC     R1
006556  001360                  BNE     3$
006560  005203                  INC     R3                      ;NEXT ADDRESS TO BE WRITTEN
006562  005300                  DEC     R0
006564  001332                  BNE     1$
006566  104400          6$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
 35 006570              MEMT3   ↑/BC/,↑/BYTE COUNT/,52525,↑/52525/

                                ;BYTE COUNT MEMORY TEST
                                ;CLEAR ALL LOCATIONS IN BYTE COUNT MEMORY
                                ;SET SELECTED LOCATION TO VALUE 52525
                                ;VERIFY THAT SELECTED LOCATION WAS SET
                                ;TO 52525.
                                ;VERIFY THAT NO OTHER LOCATION WAS MODIFIED.

006570                          TS \XN,100,6$,2$
006570  012767  000340  171200  T50:    MOV     #340,PS         ;DISABLE ALL INTERRUPTS
006576  012767  000100  002576          MOV     #100,ICOUNT     ;SET UP FOR 100 ITERATIONS
006604  012767  006742  002564          MOV     #6$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <2$>
006612  012767  006636  002560          MOV     #2$,FREEZ1      ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000051                  XN=XN+1
006620  012700  000020                  MOV     #20,R0          ;SET UP TO TEST 20(OCTAL)
                                                                ;LOCATIONS IN BYTE COUNT MEMORY
006624  005003                  CLR     R3                      ;FIRST LOCATION TO BE
                                                                ;WRITTEN INTO IS 0
006626  012701  000020          1$:     MOV     #20,R1          ;SET UP TO CLEAR 20 (OCTAL)
                                                                ;LOCATIONS IN BYTE COUNT MEMORY
006632  005077  002476                  CLR     @DHSCR          ;START AT LOCATION 0
006636  005077  002502          2$:     CLR     @DHBC           ;CLEAR LOCATION IN
                                                                ;BYTE COUNT MEMORY
006642  005277  002466                  INC     @DHSCR          ;ADVANCE TO NEXT LOCATION
006646  005301                  DEC     R1                      ;CONTINUE CLEARING
006650  001372                  BNE     2$                      ;IF NOT DONE
006652  010377  002456                  MOV     R3,@DHSCR       ;SELECT ADDRESS TO BE TESTED
006656  012777  052525  002460          MOV     #52525,@DHBC    ;WRITE 52525 INTO LOCATION
006664  005077  002444                  CLR     @DHSCR          ;ADDRESS LOCATION 0
006670  012701  000020                  MOV     #20,R1          ;SET UP TO CHECK ALL ADDRESSES
                                                                ;IN BYTE COUNT MEMORY
006674  012705  052525          3$:     MOV     #52525,R5       ;52525=EXPECTED RESULT
                                                                ;IF ADDRESS READ IS LOCATION
                                                                ;WRITTEN INTO
006700  017704  002440                  MOV     @DHBC,R4        ;READ MEMORY LOCATION
006704  027703  002424                  CMP     @DHSCR,R3       ;IF LINE NUMBER=ADDRESS
                                                                ;OF LOCATION WRITTEN INTO
                                                                ;EXPECTED CONTENTS=52525
006710  001401                  BEQ     4$
006712  005005                  CLR     R5                      ;OTHERWISE, EXPECTED RESULTS=0
006714  020504          4$:     CMP     R5,R4                   ;DOES MEMORY LOCATION CONTAIN
006716  001401                  BEQ     5$                      ;EXPECTED RESULT
                                .IIF IDN        <BC>,<BA>,      HLT     3       ;BUS ADDRESS MEMORY ERROR
006720                          .IIF IDN        <BC>,<BC>,      HLT     4       ;BYTE COUNT MEMORY ERROR
006720  104004                  EMT     4
006722  104410          5$:     SCOPE1                          ;CHECK FOR LOOP WITH CURRENT DATA
006724  005277  002404                  INC     @DHSCR          ;CHECK CONTENTS OF NEXT LOCATION
006730  005301                  DEC     R1
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```
006732  001360                          BNE     3$
006734  005203                          INC     R3                      ;NEXT ADDRESS TO BE WRITTEN
006736  005300                          DEC     R0
006740  001332                          BNE     1$
006742  104400                  6$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
     36 006744                  MEMT4   ↑/BA/,↑/BUS ADDRESS/,0,↑/0/

                                        ;BUS ADDRESS MEMORY TEST
                                        ;SET ALL LOCATIONS IN BUS ADDRESS MEMORY TO 177777
                                        ;SET SELECTED LOCATION TO VALUE 0
                                        ;VERIFY THAT SELECTED LOCATION WAS SET
                                        ;TO 0.
                                        ;VERIFY THAT NO OTHER LOCATION WAS MODIFIED.

006744                                  TS \XN,100,6$,2$
006744  012767  000340  171024    T51:  MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
006752  012767  000100  002422          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
006760  012767  007120  002410          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <2$>
006766  012767  007012  002404          MOV     #2$,FREEZ1              ;SET UP TO LOOP WITH DATA       ; 3
        000052                  .ENDC
                                XN=XN+1
006774  012700  000020                  MOV     #20,R0                  ;SET UP TO TEST 20(OCTAL)
                                                                        ;LOCATIONS IN BUS ADDRESS MEMORY
007000  005003                          CLR     R3                      ;FIRST LOCATION TO BE
                                                                        ;WRITTEN INTO IS 0
007002  012701  000020          1$:     MOV     #20,R1                  ;SET UP TO SET 20 (OCTAL)
                                                                        ;LOCATIONS IN BUS ADDRESS MEMORY TO 177777
007006  005077  002322                  CLR     @DHSCR                  ;START AT LOCATION 0
007012  012777  177777  002322  2$:     MOV     #177777,@DHBA           ;SET LOCATION IN
                                                                        ;BUS ADDRESS MEMORY
007020  005277  002310                  INC     @DHSCR                  ;ADVANCE TO NEXT LOCATION
007024  005301                          DEC     R1                      ;CONTINUE SETTING
007026  001371                          BNE     2$                      ;IF NOT DONE
007030  010377  002300                  MOV     R3,@DHSCR               ;SELECT ADDRESS TO BE TESTED
007034  012777  000000  002300          MOV     #0,@DHBA                ;WRITE 0 INTO LOCATION
007042  005077  002266                  CLR     @DHSCR                  ;ADDRESS LOCATION 0
007046  012701  000020                  MOV     #20,R1                  ;SET UP TO CHECK ALL ADDRESSES
                                                                        ;IN BUS ADDRESS MEMORY
007052  012705  000000          3$:     MOV     #0,R5           ;0=EXPECTED RESULT
                                                                        ;IF ADDRESS READ IS LOCATION
                                                                        ;WRITTEN INTO
007056  017704  002260                  MOV     @DHBA,R4                ;READ MEMORY LOCATION
007062  027703  002246                  CMP     @DHSCR,R3               ;IF LINE NUMBER=ADDRESS
                                                                        ;OF LOCATION WRITTEN INTO
                                                                        ;EXPECTED CONTENTS=0
007066  001401                          BEQ     4$
007070  005105                          COM     R5                      ;OTHERWISE, EXPECTED RESULTS=177777
007072  020504                  4$:     CMP     R5,R4                   ;DOES MEMORY LOCATION CONTAIN
007074  001401                          BEQ     5$                      ;EXPECTED RESULT
007076                          .IIF IDN        <BA>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
007076  104003                          EMT     3
                                .IIF IDN        <BA>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
007100  104410                  5$:     SCOPE1                          ;CHECK FOR LOOP WITH CURRENT DATA
007102  005277  002226                  INC     @DHSCR                  ;CHECK CONTENTS OF NEXT LOCATION
007106  005301                          DEC     R1
007110  001360                          BNE     3$
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                007112  005203                  INC     R3                      ;NEXT ADDRESS TO BE WRITTEN
                007114  005300                  DEC     R0
                007116  001331                  BNE     1$
                007120  104400          6$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
             37 007122                  MEMT4   +/BC/,+/BYTE COUNT/,0,+/0/

                                                ;BYTE COUNT MEMORY TEST
                                                ;SET ALL LOCATIONS IN BYTE COUNT MEMORY TO 177777
                                                ;SET SELECTED LOCATION TO VALUE 0
                                                ;VERIFY THAT SELECTED LOCATION WAS SET
                                                ;TO 0.
                                                ;VERIFY THAT NO OTHER LOCATION WAS MODIFIED.

                007122                  TS \XN,100,6$,2$
                007122  012767  000340  170646  T52:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
                007130  012767  000100  002244          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
                007136  012767  007276  002232          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                        .IF NB  <2$>
                007144  012767  007170  002226          MOV     #2$,FREEZ1              ;SET UP TO LOOP WITH DATA       ; 3
                                        .ENDC
                        000053          XN=XN+1
                007152  012700  000020                  MOV     #20,R0                  ;SET UP TO TEST 20(OCTAL)
                                                                                        ;LOCATIONS IN BYTE COUNT MEMORY
                007156  005003                          CLR     R3                      ;FIRST LOCATION TO BE
                                                                                        ;WRITTEN INTO IS 0
                007160  012701  000020          1$:     MOV     #20,R1                  ;SET UP TO SET 20 (OCTAL)
                                                                                        ;LOCATIONS IN BYTE COUNT MEMORY TO 177777
                007164  005077  002144                  CLR     @DHSCR                  ;START AT LOCATION 0
                007170  012777  177777  002146  2$:     MOV     #177777,@DHBC           ;SET LOCATION IN
                                                                                        ;BYTE COUNT MEMORY
                007176  005277  002132                  INC     @DHSCR                  ;ADVANCE TO NEXT LOCATION
                007202  005301                          DEC     R1                      ;CONTINUE SETTING
                007204  001371                          BNE     2$                      ;IF NOT DONE
                007206  010377  002122                  MOV     R3,@DHSCR               ;SELECT ADDRESS TO BE TESTED
                007212  012777  000000  002124          MOV     #0,@DHBC                ;WRITE 0 INTO LOCATION
                007220  005077  002110                  CLR     @DHSCR                  ;ADDRESS LOCATION 0
                007224  012701  000020                  MOV     #20,R1                  ;SET UP TO CHECK ALL ADDRESSES
                                                                                        ;IN BYTE COUNT MEMORY
                007230  012705  000000          3$:     MOV     #0,R5           ;0=EXPECTED RESULT
                                                                                        ;IF ADDRESS READ IS LOCATION
                                                                                        ;WRITTEN INTO
                007234  017704  002104                  MOV     @DHBC,R4                ;READ MEMORY LOCATION
                007240  027703  002070                  CMP     @DHSCR,R3               ;IF LINE NUMBER=ADDRESS
                                                                                        ;OF LOCATION WRITTEN INTO
                                                                                        ;EXPECTED CONTENTS=0
                007244  001401                          BEQ     4$
                007246  005105                          COM     R5                      ;OTHERWISE, EXPECTED RESULTS=177777
                007250  020504          4$:     CMP     R5,R4                   ;DOES MEMORY LOCATION CONTAIN
                007252  001401                  BEQ     5$                      ;EXPECTED RESULT
                                        .IIF IDN        <BC>,<BA>,      HLT     3                       ;BUS ADDRESS MEMORY ERROR
                007254
                                        .IIF IDN        <BC>,<BC>,      HLT     4                       ;BYTE COUNT MEMORY ERROR
                007254  104004                  EMT     4
                007256  104410          5$:     SCOPE1                          ;CHECK FOR LOOP WITH CURRENT DATA
                007260  005277  002050                  INC     @DHSCR          ;CHECK CONTENTS OF NEXT LOCATION
                007264  005301                          DEC     R1
                007266  001360                          BNE     3$
                007270  005203                          INC     R3              ;NEXT ADDRESS TO BE WRITTEN
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                007272  005300                  DEC     R0
                007274  001331                  BNE     1$
                007276  104400          6$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
             38 007300                  MXTST2  +/LOW AND HIGH/,60,300

                                                ;MEMORY EXTENSION MEMORY TEST
                                                ;VERIFY THAT LOW AND HIGH ORDER MEMORY EXTENSION BIT CAN BE
                                                ;SET AND CLEARED IN SELECTED MEMORY EXTENSION MEMORY LOCATION
                007300                  TS \XN,100,6$,2$
                007300  012767  000340  170470 T53:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
                007306  012767  000100  002066         MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
                007314  012767  007470  002054         MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                        .IF NB  <2$>
                007322  012767  007346  002050         MOV     #2$,FREEZ1              ;SET UP TO LOOP WITH DATA       ; 3
                                        .ENDC
                        000054          XN=XN+1
                007330  012700  000020                  MOV     #20,R0                  ;SET UP TO TEST 20(OCTAL)
                                                                                        ;LOCATIONS IN MEMORY EXTENSION MEMORY
                007334  005003                          CLR     R3                      ;FIRST LOCATION TO BE
                                                                                        ;WRITEEN INTO IS 0
                007336  012701  000020          1$:     MOV     #20,R1                  ;SET UP TO CLEAR 20 (OCTAL)
                                                                                        ;LOCATIONS IN MEMORY EXTENSION MEMORY
                007342  005077  001766                  CLR     @DHSCR                  ;START AT LOCATION 0
                007346  042777  000060  001760  2$:     BIC     #60,@DHSCR              ;CLEAR LOCATION IN
                007354  012777  000000  001760         MOV     #0,@DHBA                ;MEMORY EXTENSION MEMORY
                007362  005277  001746                  INC     @DHSCR                  ;ADVANCE TO NEXT LOCATION
                007366  005301                          DEC     R1                      ;CONTINUE CLEARING
                007370  001366                          BNE     2$                      ;IF NOT DONE
                007372  010377  001736                  MOV     R3,@DHSCR               ;SELECT ADDRESS TO BE TESTED
                007376  052777  000060  001730         BIS     #60,@DHSCR              ;WRITE LOW AND HIGH INTO LOCATION
                007404  012777  000000  001730         MOV     #0,@DHBA                ;LOAD ADDRESS
                007412  005077  001716                  CLR     @DHSCR                  ;ADDRESS LOCATION 0
                007416  012701  000020                  MOV     #20,R1                  ;SET UP TO CHECK ALL ADDRESSES
                                                                                        ;IN MEMORY EXTENSION MEMORY
                007422  012705  000300          3$:     MOV     #300,R5         ;LOW AND HIGH=EXPECTED RESULT
                                                                                        ;IF ADDRESS READ IS LOCATION
                                                                                        ;WRITTEN INTO
                007426  017704  001720                  MOV     @DHSSR,R4               ;READ MEMORY LOCATION
                007432  027703  001676                  CMP     @DHSCR,R3               ;IF LINE NUMBER=ADDRESS
                                                                                        ;OF LOCATION WRITTEN INTO
                                                                                        ;EXPECTED CONTENTS=LOW AND HIGH
                007436  001401                          BEQ     4$
                007440  005005                          CLR     R5                      ;OTHERWISE, EXPECTED RESULTS=0
                007442  020504          4$:     CMP     R5,R4                   ;DOES MEMORY LOCATION CONTAIN
                007444  001401                  BEQ     5$                      ;EXPECTED RESULT
                007446                          HLT     5                       ;MEMORY EXTENSION DATA ERROR
                007446  104005                  EMT     5
                007450  104410          5$:     SCOPE1                          ;CHECK FOR LOOP WITH CURRENT DATA
                007452  005277  001656                  INC     @DHSCR          ;CHECK CONTENTS OF NEXT LOCATION
                007456  005301                          DEC     R1
                007460  001360                          BNE     3$
                007462  005203                          INC     R3              ;NEXT ADDRESS TO BE WRITTEN
                007464  005300                          DEC     R0
                007466  001323                          BNE     1$
                007470  104400          6$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
             39 007472                  MXTST2  +/LOW/,20,100
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                                        ;MEMORY EXTENSION MEMORY TEST
                                        ;VERIFY THAT LOW ORDER MEMORY EXTENSION BIT CAN BE
                                        ;SET AND CLEARED IN SELECTED MEMORY EXTENSION MEMORY LOCATION
 007472                         TS \XN,100,6$,2$
 007472  012767  000340  170276  T54:  MOV     #340,PS             ;DISABLE ALL INTERRUPTS
 007500  012767  000100  001674        MOV     #100,ICOUNT         ;SET UP FOR 100 ITERATIONS
 007506  012767  007662  001662        MOV     #6$,ESCAPE          ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <2$>
 007514  012767  007540  001656        MOV     #2$,FREEZ1          ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
         000055                 XN=XN+1
 007522  012700  000020              MOV     #20,R0              ;SET UP TO TEST 20(OCTAL)
                                                                 ;LOCATIONS IN MEMORY EXTENSION MEMORY
 007526  005003                      CLR     R3                  ;FIRST LOCATION TO BE
                                                                 ;WRITEEN INTO IS 0
 007530  012701  000020        1$:   MOV     #20,R1              ;SET UP TO CLEAR 20 (OCTAL)
                                                                 ;LOCATIONS IN MEMORY EXTENSION MEMORY
 007534  005077  001574              CLR     @DHSCR              ;START AT LOCATION 0
 007540  042777  000060  001566  2$:  BIC     #60,@DHSCR          ;CLEAR LOCATION IN
 007546  012777  000000  001566        MOV     #0,@DHBA            ;MEMORY EXTENSION MEMORY
 007554  005277  001554              INC     @DHSCR              ;ADVANCE TO NEXT LOCATION
 007560  005301                      DEC     R1                  ;CONTINUE CLEARING
 007562  001366                      BNE     2$                  ;IF NOT DONE
 007564  010377  001544              MOV     R3,@DHSCR           ;SELECT ADDRESS TO BE TESTED
 007570  052777  000020  001536        BIS     #20,@DHSCR          ;WRITE LOW INTO LOCATION
 007576  012777  000000  001536        MOV     #0,@DHBA            ;LOAD ADDRESS
 007604  005077  001524              CLR     @DHSCR              ;ADDRESS LOCATION 0
 007610  012701  000020              MOV     #20,R1              ;SET UP TO CHECK ALL ADDRESSES
                                                                 ;IN MEMORY EXTENSION MEMORY
 007614  012705  000100        3$:   MOV     #100,R5       ;LOW=EXPECTED RESULT
                                                                 ;IF ADDRESS READ IS LOCATION
                                                                 ;WRITTEN INTO
 007620  017704  001526              MOV     @DHSSR,R4           ;READ MEMORY LOCATION
 007624  027703  001504              CMP     @DHSCR,R3           ;IF LINE NUMBER=ADDRESS
                                                                 ;OF LOCATION WRITTEN INTO
                                                                 ;EXPECTED CONTENTS=LOW
 007630  001401                      BEQ     4$
 007632  005005                      CLR     R5                  ;OTHERWISE, EXPECTED RESULTS=0
 007634  020504                4$:   CMP     R5,R4               ;DOES MEMORY LOCATION CONTAIN
 007636  001401                      BEQ     5$                  ;EXPECTED RESULT
 007640                              HLT     5                   ;MEMORY EXTENSION DATA ERROR
 007640  104005                      EMT     5
 007642  104410                5$:   SCOPE1                      ;CHECK FOR LOOP WITH CURRENT DATA
 007644  005277  001464              INC     @DHSCR              ;CHECK CONTENTS OF NEXT LOCATION
 007650  005301                      DEC     R1
 007652  001360                      BNE     3$
 007654  005203                      INC     R3                  ;NEXT ADDRESS TO BE WRITTEN
 007656  005300                      DEC     R0
 007660  001323                      BNE     1$
 007662  104400                6$:   SCOPE                       ;CHECK FOR ITERATIONS, LOOP
 007664                         MXTST2  ↑/HIGH/,40,200

                                        ;MEMORY EXTENSION MEMORY TEST
                                        ;VERIFY THAT HIGH ORDER MEMORY EXTENSION BIT CAN BE
                                        ;SET AND CLEARED IN SELECTED MEMORY EXTENSION MEMORY LOCATION
 007664                         TS \XN,100,6$,2$
 007664  012767  000340  170104  T55:  MOV     #340,PS             ;DISABLE ALL INTERRUPTS
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007672  012767  000100  001502          MOV     #100,ICOUNT             ;SET UP FOR 100 ITERATIONS
007700  012767  010054  001470          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <2$>
007706  012767  007732  001464          MOV     #2$,FREEZ1              ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000056                  XN=XN+1
007714  012700  000020                  MOV     #20,R0                  ;SET UP TO TEST 20(OCTAL)
                                                                        ;LOCATIONS IN MEMORY EXTENSION MEMORY
007720  005003                  CLR     R3                              ;FIRST LOCATION TO BE
                                                                        ;WRITEEN INTO IS 0
007722  012701  000020          1$:     MOV     #20,R1                  ;SET UP TO CLEAR 20 (OCTAL)
                                                                        ;LOCATIONS IN MEMORY EXTENSION MEMORY
007726  005077  001402                  CLR     @DHSCR                  ;START AT LOCATION 0
007732  042777  000060  001374  2$:     BIC     #60,@DHSCR              ;CLEAR LOCATION IN
007740  012777  000000  001374          MOV     #0,@DH8A                ;MEMORY EXTENSION MEMORY
007746  005277  001362                  INC     @DHSCR                  ;ADVANCE TO NEXT LOCATION
007752  005301                  DEC     R1                              ;CONTINUE CLEARING
007754  001366                  BNE     2$                              ;IF NOT DONE
007756  010377  001352                  MOV     R3,@DHSCR               ;SELECT ADDRESS TO BE TESTED
007762  052777  000040  001344          BIS     #40,@DHSCR              ;WRITE HIGH INTO LOCATION
007770  012777  000000  001344          MOV     #0,@DH8A                ;LOAD ADDRESS
007776  005077  001332                  CLR     @DHSCR                  ;ADDRESS LOCATION 0
010002  012701  000020                  MOV     #20,R1                  ;SET UP TO CHECK ALL ADDRESSES
                                                                        ;IN MEMORY EXTENSION MEMORY
010006  012705  000200          3$:     MOV     #200,R5         ;HIGH=EXPECTED RESULT
                                                                        ;IF ADDRESS READ IS LOCATION
                                                                        ;WRITTEN INTO
010012  017704  001334                  MOV     @DHSSR,R4               ;READ MEMORY LOCATION
010016  027703  001312                  CMP     @DHSCR,R3               ;IF LINE NUMBER=ADDRESS
                                                                        ;OF LOCATION WRITTEN INTO
                                                                        ;EXPECTED CONTENTS=HIGH
010022  001401                  BEQ     4$
010024  005005                  CLR     R5
010026  020504          4$:     CMP     R5,R4                           ;OTHERWISE, EXPECTED RESULTS=0
010030  001401                  BEQ     5$                              ;DOES MEMORY LOCATION CONTAIN
010032                          HLT     5                               ;EXPECTED RESULT
010032  104005                  EMT     5                               ;MEMORY EXTENSION DATA ERROR
010034  104410          5$:     SCOPE1
010036  005277  001272                  INC     @DHSCR                  ;CHECK FOR LOOP WITH CURRENT DATA
010042  005301                  DEC     R1                              ;CHECK CONTENTS OF NEXT LOCATION
010044  001360                  BNE     3$
010046  005203                  INC     R3
010050  005300                  DEC     R0                              ;NEXT ADDRESS TO BE WRITTEN
010052  001323                  BNE     1$
010054  104400          6$:     SCOPE                                   ;CHECK FOR ITERATIONS, LOOP
```

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      1
      2 010056                          .EOP    +/BEGIN/

                                        ;END OF PASS
                                        ;TYPE NAME OF TEST
                                        .UPDATE PASS COUNT
                                        ;CHECK FOR EXIT TO ACT-11
                                        ;RESTART TEST

 010056  104401                 EOP:    TYPE                            ;TYPE NAME OF TEST
 010060  012005                         MEPASS
 010062  005067  001344                 CLR     LAST                    ;CLEAR LAST ERROR PC
 010066  005067  001274                 CLR     ERRFLG                  ;CLEAR ERROR FLAG
 010072  005267  001272                 INC     PASCNT                  ;UPDATE PASS COUNT
 010076  005767  170700                 TST     LIGHTS                  ; ARE WE USING LIGHTS?          ; 4
 010102  001005                         BNE     2$                      ; BRANCH IF WE ARE              ; 6
 010104  104401                         TYPE                            ; TYPE PASCOUNT MESSAGE         ; 5
 010106  012020                         PASTXT                                                          ; 5
 010110  104402                         OCTASC                          ; PRINT PASSCOUNT               ; 4
 010112  010150                         PASARG                                                                  ;4 ; 6
 010114  000403                         BR      3$                      ; CONTINUE                      ; 4
 010116                          2$:                                                                     ; 4
 010116  016767  001246  170656         MOV     PASCNT,LIGHTS           ;DISPLAY PASS COUNT
 010124                          3$:                                                                     ; 4
 010124  013701  000042                 MOV     @#42,R1                 ;CHECK FOR ACT-11 OR DDP
 010130  001405                         BEQ     RESTRT                  ;IF NOT, CONTINUE TESTING
 010132  000005                         RESET
 010134  004711                 LOGICAL:        JSR     PC,(R1)
 010136  000240                         NOP
 010140  000240                         NOP
 010142  000240                         NOP
 010144  000167  171136         RESTRT: JMP     BEGIN
 010150  000001                 PASARG: .WORD   1                       ; PARAMETERS TO PRINT PASSCOUNT  ; 5
 010152     006     002                 .BYTE   6,2                                                     ; 5
 010154  011370                         .WORD   PASCNT                                                  ; 5
      3 010156                          .SCOPE

                                        ;CHECK FOR LOOP ON CURRENT TEST                                 ; 3
                                        ;CHECK FOR ITERATION SUPPRESSION

 010156  032777  002000  170614 SCOPER: BIT     @#SW10,@SWR                                             ; 4
 010164  001030                         BNE     4$
 010166  032777  040000  170604 1$:     BIT     @#SW14,@SWR                                             ; 4
 010174  001021                         BNE     3$
 010176  032777  004000  170574         BIT     @#SW11,@SWR                                             ; 4
 010204  001006                         BNE     2$
 010206  005267  001172                 INC     LPCNT
 010212  026767  001166  001162         CMP     LPCNT,ICOUNT
 010220  001007                         BNE     3$
 010222  005067  001156         2$:     CLR     LPCNT
 010226  005067  001134                 CLR     ERRFLG
 010232  011667  001136                 MOV     (SP),RETRN
 010236  000002                         RTI
 010240  016716  001130         3$:     MOV     RETRN,(SP)
 010244  000002                         RTI
 010246  005767  001114         4$:     TST     ERRFLG
 010252  001745                         BEQ     1$
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      010254  000762                          BR      2$
    4 010256                          .SCOP1

                                              ;CHECK FOR FREEZE ON CURRENT DATA

      010256  032777  001000  170514  SCOP1R: BIT     @SW09,@SWR                      ; 4
      010264  001402                          BEQ     1$
      010266  016716  001106                  MOV     FREEZ1,(SP)
      010272  000002                  1$:     RTI
```

```
1 010274                                .ERROR

                                        ;ERROR HANDLER

 010274  032777  020000  170476 ERRORS: BIT     #SW13,@SWR                ; 4
 010302  001055                         BNE     HALTS
 010304  021667  001122                 CMP     (SP),LAST
 010310  001404                         BEQ     1$
 010312  011667  001114                 MOV     (SP),LAST
 010316  005067  001044                 CLR     ERRFLG
 010322  104406                 1$:     SAVOSP
 010324  011605                         MOV     (SP),R5
 010326  162705  000002                 SUB     #2,R5
 010332  011504                         MOV     (R5),R4
 010334  006304                         ASL     R4
 010336  006304                         ASL     R4
 010340  042704  177001                 BIC     #177001,R4
 010344  062704  012140                 ADD     #ERRTAB,R4
 010350  012467  000040                 MOV     (R4)+,ERRMSG
 010354  011467  000052                 MOV     (R4),DATABP
 010360  005767  001002                 TST     ERRFLG
 010364  001403                         BEQ     TYPMSG
 010366  005767  000040                 TST     DATABP
 010372  001011                         BNE     TYPDAT
 010374  104401                 TYPMSG: TYPE                              ; 3
 010376  011715                         MCRLF                             ; 5
 010400  104402                         OCTASC                            ; 5
 010402  010500                         ERTABO                            ; 5
 010404  012767  000001  000754         MOV     #1,ERRFLG
 010412  104401                         TYPE
 010414  000000                 ERRMSG: 0
 010416  005767  000010         TYPDAT: TST     DATABP
 010422  001404                         BEQ     RESREG
 010424  104401                         TYPE                              ; 5
 010426  011715                         MCRLF                             ; 5
 010430  104402                         OCTASC
 010432  000000                 DATABP: 0
 010434  104407                 RESREG: RESO5
 010436  005777  170336         HALTS:  TST     @SWR                      ; 4
 010442  100005                         BPL     EXITER
 010444  010046                         PUSHRO
 010446  016600  000002                 MOV     2(SP),R0
 010452  000000                         HALT
 010454  012600                         POPRO
 010456  005267  000710         EXITER: INC     ERRCNT
 010462  032777  002000  170310         BIT     #SW10,@SWR                ; 4
 010470  001402                         BEQ     1$
 010472  016716  000700                 MOV     ESCAPE,(SP)
 010476  000002                 1$:     RTI
 010500  000001                 ERTABO: 1
 010502     006     002                 .BYTE   6,2
 010504  011424                         SAVPC
```

```
        010506                          .TRPSRV
                                                ;TRAP DISPATCH SERVICE
                                                ;ARGUMENT OF TRAP IS EXTRACTED
                                                ;AND USED AS OFFSET TO OBTAIN POINTER
                                                ;TO SELECTED SUBROUTINE                                  ; 3

        010506  011646                 TRPSRV: MOV     (SP),-(SP)              ;GET PC OF RETURN
        010510  162716  000002                  SUB     #2,(SP)                 ;=PC OF TRAP
        010514  017616  000000                  MOV     @(SP),(SP)              ;GET TRP
        010520  006316                  TRPOK:  ASL     (SP)                    ;MULTIPLY TRAP ARG BY 2
        010522  042716  177001                  BIC     #177001,(SP)            ;CLEAR UNWANTED BITS
        010526  062716  012060                  ADD     #TRPTAB,(SP)            ;POINTER TO SUBROUTINE ADDRESS
        010532  017616  000000                  MOV     @(SP),(SP)              ;SUBROUTINE ADDRESS
        010536  000136                          JMP     @(SP)+                  ;GO TO SUBROUTINE
      2 010540                          .SAVREG

                                                ;SAVE PC OF TEST THAT FAILED AND R0-R5

        010540  016667  000004  000656  SV05P:  MOV     4(SP),SAVPC

                                                ;SAVE R0-R5

        010546  010567  000646          SV05:   MOV     R5,SAVR5
        010552  010467  000640                  MOV     R4,SAVR4                                        ; 3
        010556  010367  000632                  MOV     R3,SAVR3
        010562  010267  000624                  MOV     R2,SAVR2
        010566  010167  000616                  MOV     R1,SAVR1
        010572  010067  000610                  MOV     R0,SAVR0
        010576  000002                          RTI
      3 010600                          .RESREG
                                                ;RESTORE R0-R5

        010600  016700  000602          RS05:   MOV     SAVR0,R0
        010604  016701  000600                  MOV     SAVR1,R1
        010610  016702  000576                  MOV     SAVR2,R2
        010614  016703  000574                  MOV     SAVR3,R3
        010620  016704  000572                  MOV     SAVR4,R4
        010624  016705  000570                  MOV     SAVR5,R5
        010630  000002                          RTI
```

```
      1 010632                          .TYPER

                                        ;TELETYPE OUTPUT ROUTINE

 010632  017605  000000        TYPER:  MOV     @(SP),R5                ; 3
 010636  062716  000002                ADD     #2,(SP)
 010642  105777  000462        1$:     TSTB    @TPCSR
 010646  100375                        BPL     1$
 010650  105715                        TSTB    (R5)
 010652  001001                        BNE     2$
 010654  000002                        RTI
 010656  112577  000450        2$:     MOVB    (R5)+,@TPDBR
 010662  000767                        BR      1$
      2 010664                          .INSTRG

                                        ;ASCII STRING INPUT ROUTINE

 010664  017667  000000  000006  INSTRG: MOV     @(SP),MSG
 010672  062716  000002                ADD     #2,(SP)
 010676  104401                INSTR1: TYPE
 010700  000000                MSG:    0
 010702  012704  012102                MOV     #INBUF,R4
 010706  012703  000007                MOV     #7,R3
 010712  105777  000406        1$:     TSTB    @TKCSR
 010716  100375                        BPL     1$
 010720  117714  000402                MOVB    @TKDBR,(R4)
 010724  142714  000200                BICB    #200,(R4)
 010730  122427  000015                CMPB    (R4)+,#15
 010734  001413                        BEQ     INSTR2
 010736  117777  000364  000366        MOVB    @TKDBR,@TPDBR
 010744  105777  000360        2$:     TSTB    @TPCSR
 010750  100375                        BPL     2$
 010752  005303                        DEC     R3
 010754  001356                        BNE     1$
 010756  104401                INSTRE: TYPE
 010760  011711                        MQM
 010762  000745                        BR      INSTR1
 010764  000002                INSTR2: RTI
```

```
1 010766                                .PARAMS

                                        ;CONVERT ASCII STRING TO OCTAL                  ; 3

 010766  011605                 PARAMS: MOV     (SP),R5
 010770  012567  000146                 MOV     (R5)+,LOLIM
 010774  012567  000144                 MOV     (R5)+,HILIM
 011000  012567  000142                 MOV     (R5)+,DEVADR
 011004  112567  000140                 MOVB    (R5)+,LOBITS
 011010  112567  000135                 MOVB    (R5)+,ADRCNT
 011014  010516                         MOV     R5,(SP)
 011016  005005                 PARAM1: CLR     R5
 011020  012704  012102                 MOV     #INBUF,R4
 011024  122714  000015                 CMPB    #15,(R4)
 011030  001420                         BEQ     PARERR
 011032  121427  000060         1$:     CMPB    (R4),#60
 011036  002415                         BLT     PARERR
 011040  121427  000067                 CMPB    (R4),#67
 011044  003012                         BGT     PARERR
 011046  142714  000060                 BICB    #60,(R4)
 011052  152405                         BISB    (R4)+,R5
 011054  122714  000015                 CMPB    #15,(R4)
 011060  001406                         BEQ     LIMITS
 011062  006305                         ASL     R5
 011064  006305                         ASL     R5
 011066  006305                         ASL     R5
 011070  000760                         BR      1$
 011072  104404                 PARERR: INSTER
 011074  000750                         BR      PARAM1

                                        ;TEST TO SEE IF NUMBER IS WITHIN LIMITS

 011076  020567  000042         LIMITS: CMP     R5,HILIM
 011102  101373                         BHI     PARERR
 011104  020567  000032                 CMP     R5,LOLIM
 011110  103770                         BLO     PARERR
 011112  136705  000032                 BITB    LOBITS,R5                       ; 3
 011116  001365                         BNE     PARERR

                                        ;STORE NUMBER AT SPECIFIED ADDRESS

 011120  016704  000022                 MOV     DEVADR,R4
 011124  010524                 1$:     MOV     R5,(R4)+
 011126  062705  000002                 ADD     #2,R5
 011132  105367  000013                 DECB    ADRCNT
 011136  001372                         BNE     1$
 011140  000002                         RTI
 011142  000000                 LOLIM:  0
 011144  000000                 HILIM:  0
 011146  000000                 DEVADR: 0
 011150  000000                 LOBITS: 0
         011151                 ADRCNT=LOBITS+1
```

```
011152                          .OCTASC

                                ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER

011152  017601  000000  OCTASN: MOV     @(SP),R1                        ; 5
011156  062716  000002          ADD     #2,(SP)
011162  012167  000130          MOV     (R1)+,WRDCNT
011166  112167  000126  1$:     MOVB    (R1)+,CHRCNT
011172  112167  000123          MOVB    (R1)+,SPACNT                    ; 3
011176  013167  000120          MOV     @(R1)+,BINWRD
011202  016704  000114  2$:     MOV     BINWRD,R4
011206  116705  000106          MOVB    CHRCNT,R5
011212  012700  012114          MOV     #TEMP,R0
011216  010403          3$:     MOV     R4,R3
011220  042703  177770          BIC     #177770,R3
011224  062703  000260          ADD     #260,R3
011230  110320                  MOVB    R3,(R0)+
011232  006204                  ASR     R4
011234  006204                  ASR     R4
011236  006204                  ASR     R4
011240  005305                  DEC     R5
011242  001365                  BNE     3$
011244  012703  012126          MOV     #MDATA,R3
011250  114023          4$:     MOVB    -(R0),(R3)+
011252  105367  000042          DECB    CHRCNT
011256  001374                  BNE     4$
011260  105767  000035          TSTB    SPACNT
011264  001405                  BEQ     6$
011266  112723  000240  5$:     MOVB    #240,(R3)+
011272  105367  000023          DECB    SPACNT
011276  001373                  BNE     5$
011300  105013          6$:     CLRB    (R3)
011302  104401                  TYPE
011304  012126                  MDATA
011306  005367  000004          DEC     WRDCNT
011312  001325                  BNE     1$
011314  000002                  RTI
011316  000000          WRDCNT: 0
011320  000000          CHRCNT: 0
        011321          SPACNT=CHRCNT+1
011322  000000          BINWRD: 0
```

```
        011324                          .POINT  ↑/DHSCR,DHNRC,DHLPR,DHBA,DHBC,DHBAR,DHBCR,DHSSR,DHSLR,DHRVEC,DHRLVL,DHTVEC,DHTLVL/
                                                ;INDIRECT POINTERS                                                              ; 3

        011324  177560                 TKCSR:  177560
        011326  177562                 TKDBR:  177562
        011330  177564                 TPCSR:  177564
        011332  177566                 TPDBR:  177566
                                        .IRP    A       <DHSCR,DHNRC,DHLPR,DHBA,DHBC,DHBAR,DHBCR,DHSSR,DHSLR,DHRVEC,DHRLVL,DHTVEC,DH
TLVL>
                                        A:      0
                                        .ENDM
        011334  000000                 DHSCR:  0
        011336  000000                 DHNRC:  0
        011340  000000                 DHLPR:  0
        011342  000000                 DHBA:   0
        011344  000000                 DHBC:   0
        011346  000000                 DHBAR:  0
        011350  000000                 DHBCR:  0
        011352  000000                 DHSSR:  0
        011354  000000                 DHSLR:  0
        011356  000000                 DHRVEC: 0
        011360  000000                 DHRLVL: 0
        011362  000000                 DHTVEC: 0
        011364  000000                 DHTLVL: 0
      2 011366                          .VARIA
                                                ;PROGRAM VARIABLES

        011366  000000                 ERRFLG: 0               ;ERROR FLAG
        011370  000000                 PASCNT: 0               ;PASS COUNT
        011372  000000                 ERRCNT: 0               ;ERROR COUNT
        011374  000000                 RETRN:  0               ;SCOPE RETURN ADDRESS FOR TEST LOOPING
        011376  000000                 ESCAPE: 0               ;ADDRESS FOR ERROR ESCAPE
        011400  000000                 FREEZ1: 0               ;DATA LOOPING RETURN ADDRESS
        011402  000000                 ICOUNT: 0               ;ITERATION COUNT FOR TEST IN PROGRESS
        011404  000000                 LPCNT:  0               ;NUMBER OF ITERATIONS THIS TEST
        011406  000000                 SAVR0:  0               ;R0 SAVE AREA
        011410  000000                 SAVR1:  0               ;R1 SAVE AREA
        011412  000000                 SAVR2:  0               ;R2 SAVE AREA                                                   ; 3
        011414  000000                 SAVR3:  0               ;R3 SAVE ARE
        011416  000000                 SAVR4:  0               ;R4 SAVE AREA
        011420  000000                 SAVR5:  0               ;R5 SAVE AREA
        011422  000000                 SAVSP:  0               ;STACK POINTER SAVE AREA
        011424  000000                 SAVPC:  0               ;CALLING ROUTINE SAVE AREA
        011426  000000                 INIFLG: 0               ;PROGRAM INITIALIZATION FLAG
        011430  000000                 STFLG:  0               ;PROGRAM START FLAG
        011432  000000                 LAST:   0               ;LAST ERROR PC
                                        .IRP    A       <>
                                        A:      0
                                        .ENDM
```

```
1 011434                                .PFAIL
                                        ;ENTER HERE ON POWER FAILURE

 011434  010046                 PFAIL:  MOV     R0,-(SP)            ;SAVE R0-R5 ON PROCESSOR STACK
 011436  010146                         MOV     R1,-(SP)
 011440  010246                         MOV     R2,-(SP)
 011442  010346                         MOV     R3,-(SP)
 011444  010446                         MOV     R4,-(SP)
 011446  010546                         MOV     R5,-(SP)
 011450  016746  166350                 MOV     24,-(SP)
 011454  010667  177742                 MOV     SP,SAVSP            ;SAVE STACK POINTER
 011460  012767  011472  166336         MOV     #RESTART,24         ;SET UP FOR POWER UP TRAP       ; 3
 011466  000000                         HALT                        ;HALT ON POWER DOWN NORMAL
 011470  000777                         BR      .

                                        ;PROCESSOR WILL TRAP HERE WHEN POWER IS RESTORED

 011472  016706  177724         RESTAR: MOV     SAVSP,SP            ;RESTORE STACK POINTER
 011476  012605                         MOV     (SP)+,R5            ;RESTORE R0-R5
 011500  012604                         MOV     (SP)+,R4
 011502  012603                         MOV     (SP)+,R3
 011504  012602                         MOV     (SP)+,R2
 011506  012601                         MOV     (SP)+,R1
 011510  012600                         MOV     (SP)+,R0
 011512  012767  011434  166304         MOV     #PFAIL,24           ;SET UP FOR POWER FAILURE
 011520  012767  000340  166250         MOV     #340,PS
 011526  012706  012774                 MOV     #STACK,SP
 011532  005067  000356                 CLR     TEMP
 011536  005267  000352                 INC     TEMP
 011542  001375                         BNE     .-4
 011544  104401                         TYPE                                                    ; 5
 011546  011715                         MCRLF                                                   ; 5
 011550  104402                         OCTASC
 011552  011574                         PFTAB
 011554  104401                         TYPE
 011556  011720                         MPFAIL
 011560  005067  177602                 CLR     ERRFLG
 011564  005067  177642                 CLR     LAST
 011570  000177  177600                 JMP     @RETRN
 011574  000001                 PFTAB:  1
 011576  000006  000002                 6,2
 011602  011374                         RETRN
```

```
                                        .MSG    †/DH11 MEMORY TEST/,†/CZDHB-CO/
011604  015     012     012     MTITLE: .ASCIZ  <15><12><12>/DH11 MEMORY TEST /<15><12>
011607  104     110     061
011612  061     040     115
011615  105     115     117
011620  122     131     040
011623  124     105     123
011626  124     040     015
011631  012     000
011633  015     012     126     MVECTO: .ASCIZ  <15><12>/VECTOR ADDRESS-/
011636  105     103     124
011641  117     122     040
011644  101     104     104
011647  122     105     123
011652  123     055     000
011655  015     012     103     MREGAD: .ASCIZ  <15><12>/CONTROL REGISTER ADDRESS-/
011660  117     116     124
011663  122     117     114
011666  040     122     105
011671  107     111     123
011674  124     105     122
011677  040     101     104
011702  104     122     105
011705  123     123     055
011710  000
011711  040     040     077     MQM:    .ASCIZ  /  ?/
011714  000
011715  015     012     000     MCRLF:  .ASCIZ   <15><12>

011720  040     040     120     MPFAIL: .ASCIZ  /  POWER FAILURE, PROGRAM RESTART AT TEST IN PROGRESS/
011723  117     127     105
011726  122     040     106
011731  101     111     114
011734  125     122     105
011737  054     040     120
011742  122     117     107
011745  122     101     115
011750  040     122     105
011753  123     124     101
011756  122     124     040
011761  101     124     040
011764  124     105     123
011767  124     040     111
011772  116     040     120
011775  122     117     107
012000  122     105     123
012003  123     000
012005  015     012     103     MEPASS: .ASCIZ  <15><12>/CZDHB-CO/
012010  132     104     110
012013  102     055     103
012016  060     000
012020  015     012     120     PASTXT: .ASCIZ  <15><12>/PASS COUNT = /                 : 5
012023  101     123     123
012026  040     103     117
012031  125     116     124
012034  040     075     040
012037  000
```

```
        012040     015     012     122  MR:      .ASCIZ  <15><12>/R/
        012043     000
        012044     015     012     124  MTSTPC:  .ASCIZ  <15><12>/TEST PC-/
        012047     105     123     124
        012052     040     120     103
        012055     055     000
                                        .EVEN
      2 012060                          .TRPTAB

                                                ;TABLE OF POINTERS FOR TRAP DECODING

        012060  010156                  TRPTAB:  SCOPER
        012062  010632                           TYPER
        012064  011152                           OCTASN
        012066  010664                           INSTRG
        012070  010756                           INSTRE
        012072  010766                           PARAMS
        012074  010540                           SVOSP
        012076  010600                           RSOS
        012100  010256                           SCOP1R
      3 012102                          .BUFFER

                                                ;BUFFERS FOR INPUT-OUTPUT

        012102  000000                  INBUF:   0
                012114                  .=.+10
        012114  000000                  TEMP:    0
                012126                  .=.+10

        012126  000000                  MDATA:   0
                012140                  .=.+10
      4 012140                          .ERRTAB

                                                ;TABLE OF POINTERS TO ERROR MESSAGES AND DATA

        012140                          ERRTAB:
      5 012140  000000                           0
      6 012142  000000                           0
      7 012144  012170                           EM1
      8 012146  012526                           DT1
      9 012150  012252                           EM2
     10 012152  012526                           DT1
     11 012154  012333                           EM3
     12 012156  012544                           DT2
     13 012160  012401                           EM4
     14 012162  012534                           DT2
     15 012164  012446                           EM5
     16 012166  012556                           DT3
     17 012170     102     125     123  EM1:     .ASCIZ  /BUS ADDRESS MEMORY ERROR/<15><12>/EXP     REC     ADDRESS/
        012173     040     101     104
        012176     104     122     105
        012201     123     123     040
        012204     115     105     115
        012207     117     122     131
        012212     040     105     122
        012215     122     117     122
        012220     015     012     105
```

```
                012223      130     120     040
                012226      040     040     040
                012231      040     122     105
                012234      103     040     040
                012237      040     040     040
                012242      101     104     104
                012245      122     105     123
                012250      123     000
     18         012252      102     131     124     EM2:    .ASCIZ  /BYTE COUNT MEMORY ERROR/<15><12>/EXP     REC     ADDRESS/
                012255      105     040     103
                012260      117     125     116
                012263      124     040     115
                012266      105     115     117
                012271      122     131     040
                012274      105     122     122
                012277      117     122     015
                012302      012     105     130
                012305      120     040     040
                012310      040     040     040
                012313      122     105     103
                012316      040     040     040
                012321      040     040     101
                012324      104     104     122
                012327      105     123     123
                012332      000
     19         012333      102     125     123     EM3:    .ASCIZ  /BUS ADDRESS MEMORY ERROR/<15><12>/EXP     REC/
                012336      040     101     104
                012341      104     122     105
                012344      123     123     040
                012347      115     105     115
                012352      117     122     131
                012355      040     105     122
                012360      122     117     122
                012363      015     012     105
                012366      130     120     040
                012371      040     040     040
                012374      040     122     105
                012377      103     000
     20         012401      102     131     124     EM4:    .ASCIZ  /BYTE COUNT MEMORY ERROR/<15><12>/EXP     REC/
                012404      105     040     103
                012407      117     125     116
                012412      124     040     115
                012415      105     115     117
                012420      122     131     040
                012423      105     122     122
                012426      117     122     015
                012431      012     105     130
                012434      120     040     040
                012437      040     040     040
                012442      122     105     103
                012445      000
     21         012446      115     105     115     EM5:    .ASCIZ  /MEMORY EXTENSION ERROR/<15><12>/EXP     REC     ADDRESS/
                012451      117     122     131
                012454      040     105     130
                012457      124     105     116
                012462      123     111     117
                012465      116     040     105
```

```
          012470     122     122     117
          012473     122     015     012
          012476     105     130     120
          012501     040     040     040
          012504     040     040     122
          012507     105     103     040
          012512     040     040     040
          012515     040     101     104
          012520     104     122     105
          012523     123     123     000
    22
    23 012526  000003                     DT1:    3
    24 012530     006     002             .BYTE   6,2
    25 012532  011412                             SAVR2
    26 012534     006     002             .BYTE   6,2
    27 012536  011414                             SAVR3
    28 012540     002     000             .BYTE   2,0
    29 012542  011416                             SAVR4
    30 012544  000002                     DT2:    2
    31 012546     006     002             .BYTE   6,2
    32 012550  011420                             SAVR5
    33 012552     006     002             .BYTE   6,2
    34 012554  011416                             SAVR4
    35 012556  000003                     DT3:    3
    36 012560     006     002             .BYTE   6,2
    37 012562  011420                             SAVR5
    38 012564     006     002             .BYTE   6,2
    39 012566  011416                             SAVR4
    40 012570     002     000             .BYTE   2,0
    41 012572  011414                             SAVR3
    42 012574                              .ENDCOD
       012574  000000                     ENDCOD: 0
    43          000001                     .END
```

SYMBOL TABLE

```
ADRCNT= 011151        EM3     012333        MVECTO  011633        STFLG   011430        T21     003400
ADRS  = 000000        EM4     012401        N     = 000001        SV05    010546        T22     003476
BEGIN   001306        EM5     012446        OCTASC= 104402        SV05P   010540        T23     003574
BINWRD  011322        ENDCOD  012574        OCTASN  011152        SWR     001000        T24     003672
BIT00 = 000001        EOP     010056        PARAM = 104405        SW00  = 000001        T25     003770
BIT01 = 000002        ERRCNT  011372        PARAMS  010756        SW01  = 000002        T26     004066
BIT02 = 000004        ERRFLG  011366        PARAM1  011016        SW02  = 000004        T27     004164
BIT03 = 000010        ERRMSG  010414        PARERR  011072        SW03  = 000010        T3      001634
BIT04 = 000020        ERRORS  010274        PASARG  010150        SW04  = 000020        T30     004262
BIT05 = 000040        ERRTAB  012140        PASCNT  011370        SW05  = 000040        T31     004360
BIT06 = 000100        ERTAB0  010500        PASTXT  012020        SW06  = 000100        T32     004456
BIT07 = 000200        ESCAPE  011376        PFAIL   011434        SW08  = 000400        T33     004554
BIT08 = 000400        EXITER  010456        PFTAB   011574        SW09  = 001000        T34     004652
BIT09 = 001000        FREEZ1  011400        POPR0 = 012600        SW10  = 002000        T35     004750
BIT10 = 002000        HALTS   010436        POP1SP= 005726        SW11  = 004000        T36     005046
BIT11 = 004000        HILIM   011144        POP2SP= 022626        SW12  = 010000        T37     005144
BIT12 = 010000        ICOUNT  011402        PS    = 177776        SW13  = 020000        T4      001732
BIT13 = 020000        INBUF   012102        PUSHR0= 010046        SW14  = 040000        T40     005242
BIT14 = 040000        INIFLG  011426        PUSH1S= 005746        SW15  = 100000        T41     005340
BIT15 = 100000        INSTER= 104404        PUSH2S= 024646        TEMP    012114        T42     005436
CADRS = 000000        INSTR = 104403        RESREG  010434        TKCSR   011324        T43     005534
CHRCNT  011320        INSTRE  010756        RESTAR  011472        TKDBR   011326        T44     005710
DATABP  010432        INSTRG  010664        RESTRT  010144        TPCSR   011330        T45     006064
DEVADR  011146        INSTR1  010676        RES05 = 104407        TPDBR   011332        T46     006240
DHBA    011342        INSTR2  010764        RETRN   011374        TRPOK   010520        T47     006414
DHBAR   011346        LAST    011432        RS05    010600        TRPSRV  010506        T5      002030
DHBC    011344        LIGHTS  001002        SAVPC   011424        TRPTAB  012060        T50     006570
DHBCR   011350        LIMITS  011076        SAVR0   011406        TYPDAT  010416        T51     006744
DHLPR   011340        LOBITS  011150        SAVR1   011410        TYPE  = 104401        T52     007122
DHNRC   011336        LOGICA  010134        SAVR2   011412        TYPER   010632        T53     007300
DHRLVL  011360        LOLIM   011142        SAVR3   011414        TYPMSG  010374        T54     007472
DHRVEC  011356        LPCNT   011404        SAVR4   011416        T1      001400        T55     007664
DHSCR   011334        MCRLF   011715        SAVR5   011420        T10     002322        T6      002126
DHSLR   011354        MDATA   012126        SAVSP   011422        T11     002420        T7      002224
DHSSR   011352        MEPASS  012005        SAV05P= 104406        T12     002516        VEC1    001164
DHTLVL  011364        MPFAIL  011720        SCOPE = 104400        T13     002614        VEC2    001174
DHTVEC  011362        MQM     011711        SCOPER  010156        T14     002712        WRDCNT  011316
DT1     012526        MR      012040        SCOPE1= 104410        T15     003010        X     = 000000
DT2     012544        MREGAD  011655        SCOP1R  010256        T16     003106        XADRS = 000020
DT3     012556        MSG     010700        SPACNT= 011321        T17     003204        XCADRS= 000020
EM1     012170        MTITLE  011604        STACK = 012774        T2      001516        XN    = 000056
EM2     012252        MTSTPC  012044        START   001004        T20     003302        Y     = 000011

. ABS.  012576      000
        000000      001
ERRORS DETECTED:  0

VIRTUAL MEMORY USED:  20224 WORDS  ( 79 PAGES)
DYNAMIC MEMORY AVAILABLE FOR  71 PAGES
CZDHBC.BIN,CZDHBC.SEQ=CZDHBC.DOC,DHMACA.MAC,CZDHBC.P11
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