DH11

LOGIC TEST

MD-11-DZDHC-B

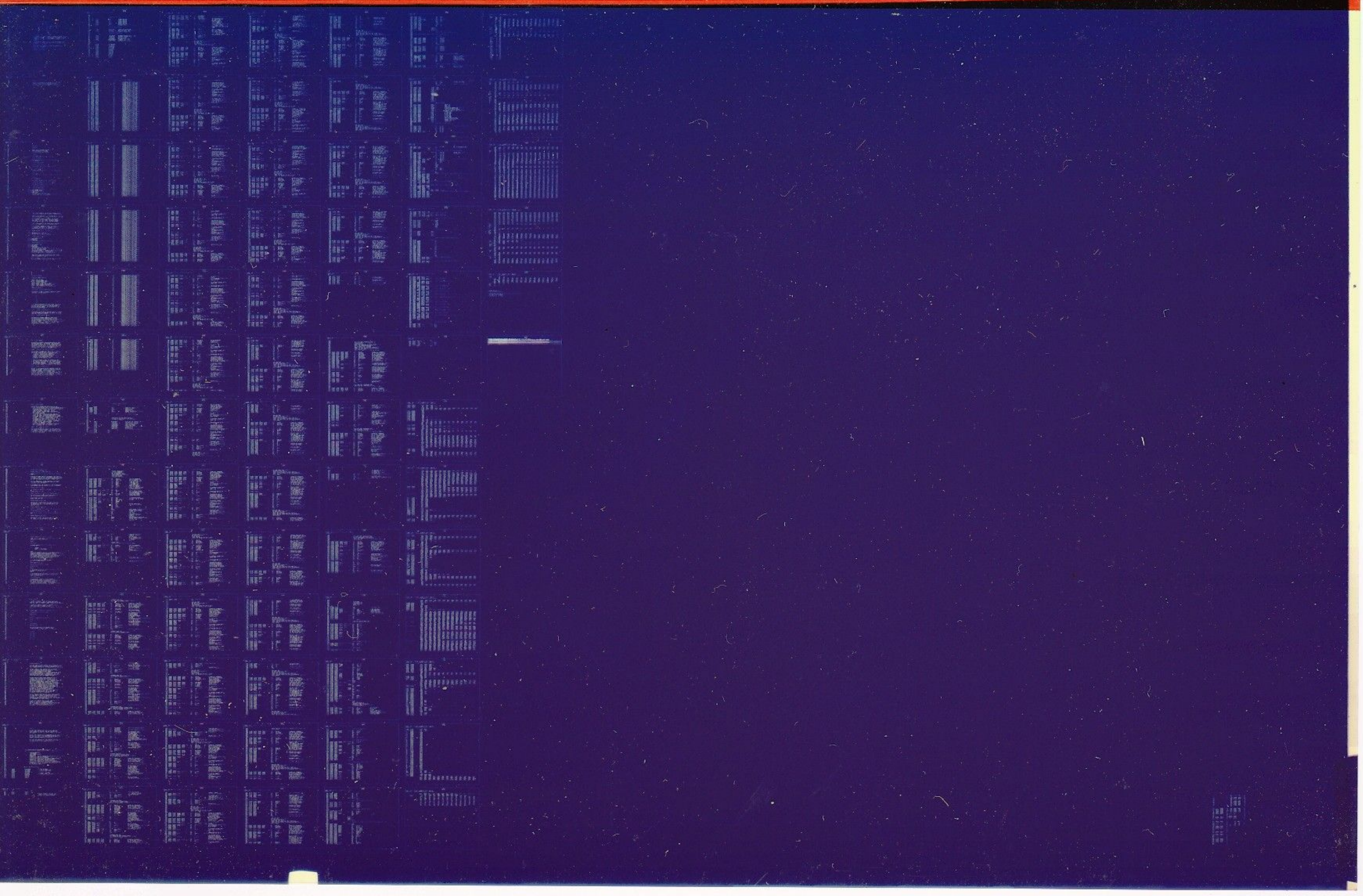
EP-DZDHC-B-DL-A

FICHE 1 OF 1

NOV 1976

digital

MADE IN U.S.A.



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IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZDHC-B-D

PRODUCT NAME: DH11 TRANSMITTER AND RECEIVER LOGIC TEST

DATE: APRIL 1976

MAINTAINER: DIAGNOSTIC GROUP

AUTHOR: MICHAEL DAVIS

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                                1.      ABSTRACT

                                        THE DH11 TRANSMITTER AND RECEIVER LOGIC TEST CHECKS
                                        THE BASIC TRANSMITTER AND RECEIVER FUNCTIONS.
                                        FUNCTIONS TESTED INCLUDE INTERRUPTS, OPERATION OF
                                        TRANSMITTER NPR LOGIC, AND OPERATION OF RECEIVER SILO LOGIC.
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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 XXXX
AND WILL THEN TYPE "VECTOR ADDRESS-" AND WAIT FOR AN
INPUT FROM THE TELETYPE KEYBOARD.

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 XXXX
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 XXXX
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

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                        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 CURRENT TEST
                                SW01=1, START PROGRAM AT SELECTED TEST
                                SW00=1, CHANGE PARAMETERS AT PROGRAM RESTART

                        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.
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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 "DZDHX" 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 "DZDHX" 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.

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                                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

                                6.2.3   ILLEGAL INTERRUPTS

                                        IF AN INTERRUPT OCCURS TO A VECTOR ADDRESS NOT
                                        SELECTED DURING PROGRAM INITIALIZATION, THE PROGRAM WILL
                                        HALT IN THE TRAPCATCHER. THE ADDRESS AT WHICH
                                        THE PROGRAM HALTS IS 2 GREATER THAN THE ADDRESS
                                        TO WHICH THE INTERRUPT OCCURED.  THE PROGRAM MUST BE
                                        RESTARTED AT 200 TO RECOVER FROM THIS ERROR.
```

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 DZDHX TO END OF TYPEOUT OF DZDHX)
IS GIVEN FOR VARIOUS PROCESSORS IN THE TABLE BELOW

PROCESSOR	TIME
PDP-11/05,10	
PDP-11/20	
PDP-11/40	
PDP-11/45	

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                                9.      PROGRAM DESCRIPTION

                                        THE FIRST GROUP OF TESTS VERIFIES THAT NO INTERRUPTS OCCUR
                                        WITH INTERRUPT ENABLES SET FOR EACH INTERRUPTING FUNCTION
                                        AND THE ASSOCIATED DONE BIT OR FLAG FOR THAT FUNCTION CLEARED.

                                        THE NEXT GROUP OF TESTS VERIFIES THAT AN INTERRUPT DOES
                                        OCCUR IF A SPECIFIC DONE BIT OR FLAG IS SET, ALONG
                                        WITH ITS CORRESPONDING INTERRUPT ENABLE.
                                        AT THIS TIME, INTERRUPTS TO THE CORRECT VECTOR ARE TESTED.
                                        IF AN INTERRUPT OCCURS TO ANY VECTOR OTHER THAN THOSE
                                        SELECTED AT PROGRAM START, THE PROGRAM WILL HALT IN THE
                                        TRAPCATCHER IN A LOCATION 2 GREATER THAN THE ADDRESS
                                        OF THE VECTOR TO WHICH THE INTERRUPT OCCURED.

                                        THE NEXT GROUP OF TESTS CHECKS TRANSMITTER NPR AND
                                        INTERRUPT LOGIC OPERATION FOR EACH LINE, IN AN
                                        INDIVIDUAL TEST FOR EACH LINE.  THE BYTE COUNT FOR
                                        THE SELECTED LINE IS SET TO -1 (FOR 1 CHARACTER TRANSMISSION)
                                        AND THE BUS ADDRESS MEMORY LOCATION FOR THAT LIN IS
                                        SET TO 0.  THE BAR BIT FOR THE SELECTED LINE IS SET,
                                        TRANSMITTER INTERRUPT ENABLE IS SET, AND THE PROCESSOR
                                        STATUS WORD IS CLEARED TO ALLOW INTERRUPTS TO OCCUR.
                                        A DELAY LOOP IS THEN ENTERED, AND IF THE DELAY TIMES
                                        OUT BEFORE AN INTERRUPT OCCURS, AN ERROR MESSAGE IS
                                        TYPED.  IF AN INTERRUPT DOES OCCUR, THE CONTROL REGISTER
                                        IS TESTED TO SEE IF THE TRANSMITTER DONE BIT
                                        HAS BEEN SET, THE BAR REGISTER IS CHECKED TO
                                        SEE THAT THE BAR BIT FOR THE SELECTED LIN HAS CLEARED,
                                        BYTE COUNT IS CHECKED TO SEE THAT IT WENT TO 0
                                        AND THE BUS ADDRESS REGISTER FOR THE SELECTED LINE
                                        IS CHECKED TO SEE THAT IT INCREMENTED TO 1.

                                        THE NEXT GROUP OF TESTS VERIFIES THAT A SINGLE SELECTED
                                        LINE WILL PERFORM TRANSMIT FUNCTIONS WITHOUT AFFECTING
                                        ANY OTHER LINE.  THIS IS DONE BY SETTING ALL BYTE
                                        COUNTS TO -1, AND VERIFYING THAT ONLY THE LINE SELECTED
                                        FOR TRANSMISSION HAD CHANGES MADE IN BYTE COUNT AND BUS ADDRESS
                                        WHEN TRANSMISSION HAS BEEN COMPLETED.

                                        THE NEXT TEST VERIFIES THAT A SINGLE CHARACTER CAN BE
                                        LOADED INTO THE SILO (IN MAINTENANCE MODE).
                                        THE TEST IS MADE WITH INTERRUPTS ENABLED AND CHECKS ARE
                                        MADE TO DETERMINE IF RECEIVER DONE WAS SET, IF THE SILO
                                        FILL LEVEL REGISTER WAS INCREMENTED, AND IF THE
                                        DATA RECEIVED IN MAINTENANCE MODE WAS CORRECT.
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                                        9.      (CONT'D)

                                                THE NEXT TEST VERIFIES THAT FROM 1 TO 63 CHARACTERS
                                                CAN BE LOADED INTO THE SILO, AND THAT THE SILO FILL
                                                LEVEL REGISTER INDICATES THE CORRECT NUMBER OF CHARACTERS
                                                IN THE SILO.

                                                THE NEXT TEST VERIFIES THAT 64 CHARACTERS CAN BE LOADED
                                                INTO THE SILO, FROM 1 TO 64 CHARACTERS CAN BE READ OUT OF
                                                THE SILO, AND THAT THE SILO FILL REGISTER INDICATES THE
                                                NUMBER OF CHARACTERS REMAINING IN THE SILO.

                                                THE FINAL TEST VERIFIES THAT THE CHARACTER AVAILABLE
                                                FLAG WILL NOT BE SET UNTIL THE SILO FILL LEVEL EXCEEDS THE
                                                SILO ALARM LEVEL, FOR ALL ALARM LEVELS 0-63.

                                        10.     LISTING


                                                !



                                        ;DH11 TRANSMITTER AND RECEIVER BASIC LOGIC TEST
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                                                ;STARTING PROCEDURE
                                                ;LOAD PROGRAM
                                                ;LOAD ADDRESS 000200
                                                ;PRESS START
                                                ;PROGRAM WILL TYPE DH11 TRANSMITTER AND RECEIVER BASIC LOGIC 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 " DZDHC "
                                                ;AND THEN RESUM TESTING


                                        ;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
```

```
   553          000010                  SW03=10
   554          000004                  SW02=4
   555          000002                  SW01=2          ;RESTART PROGRAM AT SELECTED TEST
   556          000001                  SW00=1          ;RESELECT VECTOR AND CONTROL REGISTER
   557                                                  ;ADDRESS AFTER PROGRAM RESTART
```

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                                ;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

177570                          SWR=177570      ;CONSOLE SWITCH REGISTER
177570                          LIGHTS=177570   ;PDP-11/45 DISPLAY REGISTER
177776                          PS=177776       ;PROCESSOR STATUS WORD
017102                          STACK=ENDCOD+200;START OF PROCESSOR STACK

                                ;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
                                .EQUIV  EMT,HLT ;BASIC DEFINITION OF ERROR CALL


100000                          BIT15=100000
040000                          BIT14=40000
020000                          BIT13=20000
010000                          BIT12=10000
004000                          BIT11=4000
002000                          BIT10=2000
001000                          BIT09=1000
000400                          BIT08=400
000200                          BIT07=200
000100                          BIT06=100
000040                          BIT05=40
000020                          BIT04=20
000010                          BIT03=10
000004                          BIT02=4
000002                          BIT01=2
000001                          BIT00=1
```

```
                                        ;TRAP CATCHER FOR ILLEGAL INTERRUPTS
                        000000          .=0
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
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   661  000154  000156                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   662  000156  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   663  000160  000162                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   664  000162  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   665  000164  000166                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   666  000166  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   667  000170  000172                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   668  000172  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   669  000174  000176                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   670  000176  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   671  000200  000202                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   672  000202  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   673  000204  000206                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   674  000206  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   675  000210  000212                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   676  000212  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   677  000214  000216                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   678  000216  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   679  000220  000222                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   680  000222  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   681  000224  000226                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   682  000226  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   683  000230  000232                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   684  000232  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   685  000234  000236                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   686  000236  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   687  000240  000242                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   688  000242  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   689  000244  000246                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   690  000246  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   691  000250  000252                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   692  000252  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   693  000254  000256                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   694  000256  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   695  000260  000262                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   696  000262  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   697  000264  000266                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   698  000266  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   699  000270  000272                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   700  000272  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   701  000274  000276                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   702  000276  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   703  000300  000302                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   704  000302  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   705  000304  000306                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   706  000306  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   707  000310  000312                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   708  000312  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   709  000314  000316                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   710  000316  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   711  000320  000322                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   712  000322  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   713  000324  000326                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   714  000326  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   715  000330  000332                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   716  000332  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
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   717  000334  000336                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   718  000336  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   719  000340  000342                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   720  000342  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   721  000344  000346                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   722  000346  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   723  000350  000352                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   724  000352  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   725  000354  000356                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   726  000356  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   727  000360  000362                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   728  000362  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   729  000364  000366                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   730  000366  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   731  000370  000372                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   732  000372  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   733  000374  000376                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   734  000376  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   735  000400  000402                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   736  000402  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   737  000404  000406                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   738  000406  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   739  000410  000412                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   740  000412  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   741  000414  000416                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   742  000416  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   743  000420  000422                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   744  000422  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   745  000424  000426                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   746  000426  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   747  000430  000432                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   748  000432  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   749  000434  000436                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   750  000436  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   751  000440  000442                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   752  000442  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   753  000444  000446                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   754  000446  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   755  000450  000452                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   756  000452  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   757  000454  000456                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   758  000456  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   759  000460  000462                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   760  000462  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   761  000464  000466                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   762  000466  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   763  000470  000472                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   764  000472  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   765  000474  000476                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   766  000476  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   767  000500  000502                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   768  000502  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   769  000504  000506                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   770  000506  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   771  000510  000512                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   772  000512  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
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   773  000514  000516                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   774  000516  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   775  000520  000522                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   776  000522  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   777  000524  000526                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   778  000526  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   779  000530  000532                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   780  000532  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   781  000534  000536                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   782  000536  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   783  000540  000542                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   784  000542  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   785  000544  000546                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   786  000546  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   787  000550  000552                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   788  000552  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   789  000554  000556                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   790  000556  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   791  000560  000562                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   792  000562  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   793  000564  000566                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   794  000566  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   795  000570  000572                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   796  000572  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   797  000574  000576                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   798  000576  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   799  000600  000602                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   800  000602  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   801  000604  000606                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   802  000606  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   803  000610  000612                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   804  000612  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   805  000614  000616                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   806  000616  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   807  000620  000622                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   808  000622  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   809  000624  000626                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   810  000626  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   811  000630  000632                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   812  000632  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   813  000634  000636                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   814  000636  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   815  000640  000642                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   816  000642  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   817  000644  000646                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   818  000646  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   819  000650  000652                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   820  000652  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   821  000654  000656                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   822  000656  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   823  000660  000662                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   824  000662  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   825  000664  000666                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   826  000666  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
   827  000670  000672                    .+2         ;UNEXPECTED TRAP TO THIS LOCATION
   828  000672  000000                    HALT        ;EXAMINE STACK TO FIND CAUSE
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829  000674  000676                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
830  000676  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
831  000700  000702                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
832  000702  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
833  000704  000706                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
834  000706  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
835  000710  000712                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
836  000712  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
837  000714  000716                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
838  000716  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
839  000720  000722                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
840  000722  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
841  000724  000726                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
842  000726  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
843  000730  000732                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
844  000732  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
845  000734  000736                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
846  000736  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
847  000740  000742                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
848  000742  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
849  000744  000746                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
850  000746  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
851  000750  000752                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
852  000752  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
853  000754  000756                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
854  000756  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
855  000760  000762                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
856  000762  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
857  000764  000766                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
858  000766  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
859  000770  000772                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
860  000772  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
861  000774  000776                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
862  000776  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
```

```
                                        ;STANDARD INTERRUPT VECTORS


                    000024          .=24
000024  015460                     PFAIL                   ;POWER FAIL HANDLER
000026  000340                     340                     ;SERVICE AT LEVEL 7
000030  014240                     ERRORS                  ;ERROR HANDLER
000032  000340                     340                     ;SERVICE AT LEVEL 7
000034  014442                     TRPSRV                  ;GENERAL HANDLER DISPATCH SERVICE
000036  000340                     340                     ;SERVICE AT LEVEL 7
                    000200          .=200
000200  000167  000574             JMP     START           ;GO TO START OF PROGRAM


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

                    104400              SCOPE=TRAP+Y            ;SCOPE LOOP AND ITERATION HANDLER
                    104401              TYPE=TRAP+Y             ;TELETYPE OUTPUT ROUTINE
                    104402              OCTASC=TRAP+Y           ;OCTAL TO ASCII CONVERSION
                    104403              INSTR=TRAP+Y            ;INPUT ASCII STRING
                    104404              INSTER=TRAP+Y           ;STRING INPUT ERROR
                    104405              PARAM=TRAP+Y            ;CONVERT STRING TO OCTAL, CHECK LIMITS
                    104406              SAV05P=TRAP+Y           ;SAVE R0-R5, PC
                    104407              RES05=TRAP+Y            ;RESTORE R0-R5
                    104410              SCOPE1=TRAP+Y           ;CHECK FOR FREEZE ON CURRENT DATA
                    000046          .=46
000046  014106                      LOGICAL
                    000052          .=52
000052  040000                      40000
```

```
                001000                  .=1000

                                        ;PROGRAM INITIALIZATION
                                        ;LOCK OUT INTERRUPTS
                                        ;SET UP PROCESSOR STACK
                                        ;SET UP POWER FAIL VECTOR
                                        ;CLEAR PROGRAM FLAGS AND COUNTS
                                        ;TYPE TITLE MESSAGE
                                        ;DETERMINE MEMORY SIZE

001000  012767  000340  176770  START:  MOV     #340,PS                 ;LOCK OUT INTERRUPTS
001006  012706  017102                  MOV     #STACK,SP               ;SET UP PROCESSOR STACK
001012  012737  015460  000024          MOV     #PFAIL,@#24             ;SET UP POWER FAIL TRAP
001020  005067  014426                  CLR     STFLG                   ;CLEAR TEST START FLAG
001024  005067  014362                  CLR     PASCNT                  ;CLEAR PASS COUNT
001030  005067  014360                  CLR     ERRCNT                  ;CLEAR ERROR COUNT
001034  005067  014350                  CLR     ERRFLG                  ;CLEAR ERROR FLAG
001040  005067  014344                  CLR     ERRFLG                  ;CLEAR LAST ERROR PC
001044  104401  015624                  TYPE    ,MTITLE                 ;TYPE TITLE MESSAGE
001050  005767  014374                  TST     INIFLG                  ;CHECK INITIALIZATION FLAG
001054  001021                          BNE     VEC1                    ;IF NOT 0, CHECK SWITCHES
                                                                        ;FOR REINITIALIZATION
001056  005000                  SIZE:   CLR     R0
001060  012737  001072  000004          MOV     #2$,@#4                 ;SET UP TIME OUT RETURN
001066  005720                  1$:     TST     (R0)+                   ;WILL TRAP WHEN NO MEMORY
001070  000776                          BR      1$                      ;LOCATION RESPONDED, CONTINUE
001072  010067  014360          2$:     MOV     R0,HCORE                ;R0 CONTAINS ADDRESS OF
001076  162767  000002  014352          SUB     #2,HCORE                ;NON EXISTATN MEMORY
001104  012737  000006  000004          MOV     #6,@#4                  ;RESTORE TRAPCATCHER

001112  005767  014332                  TST     INIFLG                  ;IF INITIALIZE FLAG=0
001116  001404                          BEQ     VEC2                    ;GET VECTOR AND CSR ADDRESS
001120  032767  000001  176442  VEC1:   BIT     #SW00,SWR               ;IF SW00=1, GET NEW VECTOR
001126  001445                          BEQ     BEGIN                   ;AND CSR
001130  012701  000300          VEC2:   MOV     #300,R1
001134  012702  000302                  MOV     #302,R2
001140  012703  000004                  MOV     #4,R3
001144  010211                  1$:     MOV     R2,(R1)                 ;RESTORE TRAPCATCHER
001146  005012                          CLR     (R2)                    ;IN FLOATING VECTOR AREA
001150  060301                          ADD     R3,R1
001152  060302                          ADD     R3,R2
001154  020127  001000                  CMP     R1,#1000
001160  001371                          BNE     1$
001162  104403                          INSTR                           ;INPUT ADDRESS OF DEVICE VECTOR
001164  015703                          MVECTOR                         ;MESSAGE "VECTOR ADDRESS-"
001166  104405                          [illegible]                     ;CONVERT STRING TO OCTAL
001170  000300                          300                             ;LOW LIMIT
001172  000770                          770                             ;HIGH  LIMIT
001174  015400                          DHRVEC                          ;LOCATIONS TO BE FILLED
001176     003                  .BYTE   3                               ;NUMBER OF LOCATIONS
001177     004                  .BYTE   4                               ;LSB MASK
001200  104403                          INSTR                           ;INPUT ADDRESS OF DEVICE CSR
001202  015725                          MREGAD                          ;MESSAGE "CONTROL REGISTER ADDRESS-"
001204  104405                          PARAM                           ;CONVERT STRING TO OCTAL
001206  000000                          0                               ;LOW LIMIT
001210  177776                          177776                          ;HIGH LIMIT
```

```
                                                DHSCR                           ;LOCATIONS TO BE FILLED
                                        .BYTE   7                               ;NUMBER OF LOCATIONS
                                        .BYTE   10                              ;LSB MASK
001216  016767  014152  014152          MOV     DHSSR,DHSLR                     ;SET UP ADDRESS OF SILO
001224  005267  014146                  INC     DHSLR                           ;STATUS REGISTER HIGH BYTE
001230  005767  014214                  TST     INIFLG                          ;IF INITIALIZATION FLAG
001234  001002                          BNE     BEGIN                           ;IS CLEARED
001236  005167  014206                  COM     INIFLG                          ;SET IT

                                        ;PROGRAM START
                                        ;CHECK FOR PROGRAM START AT SELECTED ADDRESS

001242  012767  000340  176526  BEGIN:  MOV     #340,PS                         ;LOCK OUT INTERRUPTS
001250  012706  017102                  MOV     #STACK,SP                       ;SET UP PROCESSOR STACK
001254  032767  000002  176306          BIT     #SW01,SWR                       ;IF SW01=1
001262  001410                          BEQ     1$                              ;GET PC FOR PROGRAM START
001264  104403                          INSTR                                   ;GET PC
001266  016071                          MTSTPC                                  ;MESSAGE "TEST PC"
001270  104405                          PARAM                                   ;CONVERT STRING TO OCTAL
001272  000000                          0
001274  017500                          17500
001276  000207                          RETURN
001300      001                 .BYTE   1
001301      001                 .BYTE   1
001302  000410                  BR      2$
001304  012767  001334  014104  1$:     MOV     #T1,RETURN                      ;NORMAL START, TEST 1
001312  005767  014134                  TST     STFLG                           ;IF LOOPING, BYPASS TYPEOUT
001316  001004                          BNE     3$
001320  005167  014126                  COM     STFLG
001324  104401  016065          2$:     TYPE    ,MR                             ;TYPE "R" TO INDICATE START
001330  000177  014062          3$:     JMP     @RETURN                         ;START TESTING
```

```
                                        ;INTERRUPT LOGIC TEST
                                        ;SET CHARACTER AVAILABLE INTERRUPT ENABLE
                                        ;VERIFY THAT NO INTERRUPTS OCCUR

001334  012767  000340  176434  T1:   MOV     #340,PS           ;DISABLE ALL INTERRUPTS
001342  012767  004000  014054        MOV     #4000,ICOUNT      ;SET UP FOR 4000 ITERATIONS
001350  012767  001470  014042        MOV     #3$,ESCAPE        ;SET UP TO ESCAPE TO NEXT TEST
001356  012777  004000  013772        MOV     #BIT11,@DHSCR     ;MASTER CLEAR INTERFACE
001364  012777  001440  014006        MOV     #1$,@DHRVEC       ;SET UP FOR POSSIBLE
                                                                ;RECEIVER INTERRUPT
001372  012777  000340  014002        MOV     #340,@DHRLVL
001400  012777  001454  013776        MOV     #2$,@DHTVEC       ;SET UP FOR POSSIBLE
                                                                ;TRANSMITTER INTERRUPT
001406  012777  000340  013772        MOV     #340,@DHTLVL
001414  012777  000100  013734        MOV     #BIT06,@DHSCR     ;SET CHARACTER AVAILABLE
                                                                ;INTERRUPT ENABLE
001422  005067  176350                CLR     PS                ;ALLOW INTERRUPTS
001426  000240                       NOP                       ;WINDOW FOR INTERRUPTS
001430  012767  000340  176340        MOV     #340,PS           ;NO INTERRUPT OCCURED
001436  000414                       BR      3$                ;CONTINUE
001440  017705  013712        1$:   MOV     @DHSCR,R5         ;GET CONTENTS OF SYSTEM CONTROL REGISTER
001444  104000                       HLT     0                 ;UNEXPECTED INTERRUPT
001446  012716  001470                MOV     #3$,(SP)                ;SET UP TO
001452  000002                       RTI                       ;RETURN FROM INTERRUPT
001454  017705  013676        2$:   MOV     @DHSCR,R5         ;GET CONTENTS OF SYSTEM CONTROL REGISTER
001460  104000                       HLT     0                 ;UNEXPECTED INTERRUPT
001462  012716  001470                MOV     #3$,(SP)                ;SET UPT TO
001466  000002                       RTI                       ;RETURN FROM INTERRUPT
001470  016777  013706  013702  3$:   MOV     DHRLVL,@DHRVEC    ;RESTORE TRAPCATCHER
001476  005077  013700                CLR     @DHRLVL
001502  016777  013700  013674        MOV     DHTLVL,@DHTVEC
001510  005077  013672                CLR     @DHTLVL
001514  104400                       SCOPE                     ;CHECK FOR ITERATIONS, LOOP

                                        ;INTERRUPT LOGIC TEST
                                        ;SET SILO OVERFLOW INTERRUPT ENABLE
                                        ;VERIFY THAT NO INTERRUPTS OCCUR

001516  012767  000340  176252  T2:   MOV     #340,PS           ;DISABLE ALL INTERRUPTS
001524  012767  004000  013672        MOV     #4000,ICOUNT      ;SET UP FOR 4000 ITERATIONS
001532  012767  001652  013660        MOV     #3$,ESCAPE        ;SET UP TO ESCAPE TO NEXT TEST
001540  012777  004000  013610        MOV     #BIT11,@DHSCR     ;MASTER CLEAR INTERFACE
001546  012777  001622  013624        MOV     #1$,@DHRVEC       ;SET UP FOR POSSIBLE
                                                                ;RECEIVER INTERRUPT
001554  012777  000340  013620        MOV     #340,@DHRLVL
001562  012777  001636  013614        MOV     #2$,@DHTVEC       ;SET UP FOR POSSIBLE
                                                                ;TRANSMITTER INTERRUPT
001570  012777  000340  013610        MOV     #340,@DHTLVL
001576  012777  010000  013552        MOV     #BIT12,@DHSCR     ;SET SILO OVERFLOW
                                                                ;INTERRUPT ENABLE
001604  005067  176166                CLR     PS                ;ALLOW INTERRUPTS
001610  000240                       NOP                       ;WINDOW FOR INTERRUPTS
001612  012767  000340  176156        MOV     #340,PS           ;NO INTERRUPT OCCURED
001620  000414                       BR      3$                ;CONTINUE
001622  017705  013530        1$:   MOV     @DHSCR,R5         ;GET CONTENTS OF SYSTEM CONTROL REGISTER
```

```
1038  001626  104000                          HLT     0                       ;UNEXPECTED INTERRUPT
1039  001630  012716  001652                  MOV     #3$,(SP)                        ;SET UP TO
1040  001634  000002                          RTI                             ;RETURN FROM INTERRUPT
1041  001636  017705  013514          2$:     MOV     @DHSCR,R5               ;GET CONTENTS OF SYSTEM CONTROL REGISTER
1042  001642  104000                          HLT     0                       ;UNEXPECTED INTERRUPT
1043  001644  012716  001652                  MOV     #3$,(SP)                        ;SET UPT TC
1044  001650  000002                          RTI                             ;RETURN FROM INTERRUPT
1045  001652  016777  013524  013520  3$:     MOV     DHRLVL,@DHRVEC          ;RESTORE TRAPCATCHER
1046  001660  005077  013516                  CLR     @DHRLVL
1047  001664  016777  013516  013512          MOV     DHTLVL,@DHTVEC
1048  001672  005077  013510                  CLR     @DHTLVL
1049  001676  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
1050
1051                                          ;INTERRUPT LOGIC TEST
1052                                          ;SET TRANSMITTER DONE INTERRUPT ENABLE
1053                                          ;VERIFY THAT NO INTERRUPTS OCCUR
1054
1055  001700  012767  000340  176070  T3:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1056  001706  012767  004000  013510          MOV     #4000,ICOUNT            ;SET UP FOR 4000 ITERATIONS
1057  001714  012767  002034  013476          MOV     #3$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1058  001722  012777  004000  013426          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1059  001730  012777  002004  013442          MOV     #1$,@DHRVEC             ;SET UP FOR POSSIBLE
1060                                                                          ;RECEIVER INTERRUPT
1061  001736  012777  000340  013436          MOV     #340,@DHRLVL
1062  001744  012777  002020  013432          MOV     #2$,@DHTVEC             ;SET UP FOR POSSIBLE
1063                                                                          ;TRANSMITTER INTERRUPT
1064  001752  012777  000340  013426          MOV     #340,@DHTLVL
1065  001760  012777  020000  013370          MOV     #BIT13,@DHSCR           ;SET TRANSMITTER DONE
1066                                                                          ;INTERRUPT ENABLE
1067  001766  005067  176004                  CLR     PS                      ;ALLOW INTERRUPTS
1068  001772  000240                          NOP                             ;WINDOW FOR INTERRUPTS
1069  001774  012767  000340  175774          MOV     #340,PS                 ;NO INTERRUPT OCCURED
1070  002002  000414                          BR      3$                      ;CONTINUE
1071  002004  017705  013346          1$:     MOV     @DHSCR,R5               ;GET CONTENTS OF SYSTEM CONTROL REGISTER
1072  002010  104000                          HLT     0                       ;UNEXPECTED INTERRUPT
1073  002012  012716  002034                  MOV     #3$,(SP)                        ;SET UP TO
1074  002016  000002                          RTI                             ;RETURN FROM INTERRUPT
1075  002020  017705  013332          2$:     MOV     @DHSCR,R5               ;GET CONTENTS OF SYSTEM CONTROL REGISTER
1076  002024  104000                          HLT     0                       ;UNEXPECTED INTERRUPT
1077  002026  012716  002034                  MOV     #3$,(SP)                        ;SET UPT TO
1078  002032  000002                          RTI                             ;RETURN FROM INTERRUPT
1079  002034  016777  013342  013336  3$:     MOV     DHRLVL,@DHRVEC          ;RESTORE TRAPCATCHER
1080  002042  005077  013334                  CLR     @DHRLVL
1081  002046  016777  013334  013330          MOV     DHTLVL,@DHTVEC
1082  002054  005077  013326                  CLR     @DHTLVL
1083  002060  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
1084
1085                                          ;INTERRUPT LOGIC TEST
1086                                          ;SET CHARACTER AVAILABLE INTERRUPT ENABLE
1087                                          ;SET CHARACTER AVAILABLE (MAINTENANCE MODE IS ENABLED
1088                                          ;VERIFY THAT AN INTERRUPT OCCURS
1089
1090  002062  012767  000340  175706  T4:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1091  002070  012767  004000  013326          MOV     #4000,ICOUNT            ;SET UP FOR 4000 ITERATIONS
1092  002076  012767  002226  013314          MOV     #3$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1093  002104  012777  004000  013244          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
```

```
1094  002112  012777  002204  013260          MOV     #1$,@DHRVEC             ;SET UP FOR RECEIVER INTERRUPT
1095  002120  012777  000340  013254          MOV     #340,@DHRLVL
1096  002126  012777  002212  013250          MOV     #2$,@DHTVEC             ;SET UP FOR TRANSMITTER INTERRUPT
1097  002134  012777  000340  013244          MOV     #340,@DHTLVL
1098  002142  012777  001000  013206          MOV     #BIT09,@DHSCR           ;SET MAINTENANCE MODE
1099  002150  052777  000100  013200          BIS     #BIT06,@DHSCR           ;SET CHARACTER AVAILABLE
1100                                                                          ;INTERRUPT ENABLE
1101  002156  052777  000200  013172          BIS     #BIT07,@DHSCR           ;FORCE INTERRUPT BY
1102                                                                          ;SETTING CHARACTER AVAILABLE
1103  002164  005067  175606                  CLR     PS                      ;ALLOW INTERRUPTS
1104  002170  000240                          NOP                             ;WINDOW FOR INTERRUPTS
1105  002172  012767  000340  175576          MOV     #340,PS                 ;NO INTERRUPT OCCURED
1106  002200  104001                          HLT     1                       ;WITH CHARACTER AVAILABLE INTERRUPT
1107                                                                          ;ENABLE AND CHARACTER AVAILABLE SET
1108                                                                          ;ERROR
1109  002202  000411                          BR      3$
1110  002204  012716  002226          1$:     MOV     #3$,(SP)                ;SET UP TO RETURN
1111  002210  000002                          RTI                             ;FROM VALID INTERRUPT
1112  002212  017705  013140          2$:     MOV     @DHSCR,R5               ;GET CONTENTS OF SYSTEM CONTROL REGISTER
1113  002216  104000                          HLT     0                       ;UNEXPECTED INTERRUPT
1114  002220  012716  002226                  MOV     #3$,(SP)                        ;SET UP TO RETURN
1115  002224  000002                          RTI                             ;FROM UNEXPECTED INTERRUPT
1116  002226  016777  013150  013144  3$:     MOV     DHRLVL,@DHRVEC          ;RESTORE TRAPCATCHER
1117  002234  005077  013142                  CLR     @DHRLVL
1118  002240  016777  013142  013136          MOV     DHTLVL,@DHTVEC
1119  002246  005077  013134                  CLR     @DHTLVL
1120  002252  104400                          SCOPE
1121
1122                                          ;INTERRUPT LOGIC TEST
1123                                          ;SET SILO OVERFLOW INTERRUPT ENABLE
1124                                          ;SET SILO OVERFLOW (MAINTENANCE MODE IS ENABLED
1125                                          ;VERIFY THAT AN INTERRUPT OCCURS
1126
1127  002254  012767  000340  175514  T5:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1128  002262  012767  004000  013134          MOV     #4000,ICOUNT            ;SET UP FOR 4000 ITERATIONS
1129  002270  012767  002420  013122          MOV     #3$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1130  002276  012777  004000  013052          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1131  002304  012777  002376  013066          MOV     #1$,@DHRVEC             ;SET UP FOR RECEIVER INTERRUPT
1132  002312  012777  000340  013062          MOV     #340,@DHRLVL
1133  002320  012777  002404  013056          MOV     #2$,@DHTVEC             ;SET UP FOR TRANSMITTER INTERRUPT
1134  002326  012777  000340  013052          MOV     #340,@DHTLVL
1135  002334  012777  001000  013014          MOV     #BIT09,@DHSCR           ;SET MAINTENANCE MODE
1136  002342  052777  040000  013006          BIS     #BIT14,@DHSCR           ;SET SILO OVERFLOW
1137                                                                          ;INTERRUPT ENABLE
1138  002350  052777  010000  013000          BIS     #BIT12,@DHSCR           ;FORCE INTERRUPT BY
1139                                                                          ;SETTING SILO OVERFLOW
1140  002356  005067  175414                  CLR     PS                      ;ALLOW INTERRUPTS
1141  002362  000240                          NOP                             ;WINDOW FOR INTERRUPTS
1142  002364  012767  000340  175404          MOV     #340,PS                 ;NO INTERRUPT OCCURED
1143  002372  104001                          HLT     1                       ;WITH SILO OVERFLOW INTERRUPT
1144                                                                          ;ENABLE AND SILO OVERFLOW SET
1145                                                                          ;ERROR
1146  002374  000411                          BR      3$
1147  002376  012716  002420          1$:     MOV     #3$,(SP)                ;SET UP TO RETURN
1148  002402  000002                          RTI                             ;FROM VALID INTERRUPT
1149  002404  017705  012746          2$:     MOV     @DHSCR,R5               ;GET CONTENTS OF SYSTEM CONTROL REGISTER
```

```
1150  002410  104000                        HLT     0                       ;UNEXPECTED INTERRUPT
1151  002412  012716  002420                MOV     #3$,(SP)                        ;SET UP TO RETURN
1152  002416  000002                        RTI                             ;FROM UNEXPECTED INTERRUPT
1153  002420  016777  012756  012752  3$:   MOV     DHRLVL,@DHRVEC          ;RESTORE TRAPCATCHER
1154  002426  005077  012750                CLR     @DHRLVL
1155  002432  016777  012750  012744        MOV     DHTLVL,@DHTVEC
1156  002440  005077  012742                CLR     @DHTLVL
1157  002444  104400                        SCOPE
1158
1159                                        ;INTERRUPT LOGIC TEST
1160                                        ;SET TRANSMITTER INTERRUPT ENABLE
1161                                        ;SET NON EXISTATN MEMORY (MAINTENANCE MODE IS ENABLED
1162                                        ;VERIFY THAT AN INTERRUPT OCCURS
1163
1164  002446  012767  000340  175322  T6:   MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1165  002454  012767  004000  012742        MOV     #4000,ICOUNT            ;SET UP FOR 4000 ITERATIONS
1166  002462  012767  002612  012730        MOV     #3$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1167  002470  012777  004000  012660        MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1168  002476  012777  002576  012674        MOV     #2$,@DHRVEC             ;SET UP FOR RECEIVER INTERRUPT
1169  002504  012777  000340  012670        MOV     #340,@DHRLVL
1170  002512  012777  002570  012664        MOV     #1$,@DHTVEC             ;SET UP FOR TRANSMITTER INTERRUPT
1171  002520  012777  000340  012660        MOV     #340,@DHTLVL
1172  002526  012777  001000  012622        MOV     #BIT09,@DHSCR           ;SET MAINTENANCE MODE
1173  002534  052777  020000  012614        BIS     #BIT13,@DHSCR           ;SET TRANSMITTER
1174                                                                        ;INTERRUPT ENABLE
1175  002542  052777  002000  012606        BIS     #BIT10,@DHSCR           ;FORCE INTERRUPT BY
1176                                                                        ;SETTING NON EXISTATN MEMORY
1177  002550  005067  175222                CLR     PS                      ;ALLOW INTERRUPTS
1178  002554  000240                        NOP                             ;WINDOW FOR INTERRUPTS
1179  002556  012767  000340  175212        MOV     #340,PS                 ;NO INTERRUPT OCCURED
1180  002564  104001                        HLT     1                       ;WITH TRANSMITTER INTERRUPT
1181                                                                        ;ENABLE AND NON EXISTATN MEMORY SET
1182                                                                        ;ERROR
1183  002566  000411                        BR      3$
1184  002570  012716  002612          1$:   MOV     #3$,(SP)                ;SET UP TO RETURN
1185  002574  000002                        RTI                             ;FROM VALID INTERRUPT
1186  002576  017705  012554          2$:   MOV     @DHSCR,R5               ;GET CONTENTS OF SYSTEM CONTROL REGISTER
1187  002602  104000                        HLT     0                       ;UNEXPECTED INTERRUPT
1188  002604  012716  002612                MOV     #3$,(SP)                        ;SET UP TO RETURN
1189  002610  000002                        RTI                             ;FROM UNEXPECTED INTERRUPT
1190  002612  016777  012564  012560  3$:   MOV     DHRLVL,@DHRVEC          ;RESTORE TRAPCATCHER
1191  002620  005077  012556                CLR     @DHRLVL
1192  002624  016777  012556  012552        MOV     DHTLVL,@DHTVEC
1193  002632  005077  012550                CLR     @DHTLVL
1194  002636  104400                        SCOPE
1195
1196                                        ;INTERRUPT LOGIC TEST
1197                                        ;SET TRANSMITTER DONE INTERRUPT ENABLE
1198                                        ;SET TRANSMITTER DONE (MAINTENANCE MODE IS ENABLED
1199                                        ;VERIFY THAT AN INTERRUPT OCCURS
1200
1201  002640  012767  000340  175130  T7:   MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1202  002646  012767  004000  012550        MOV     #4000,ICOUNT            ;SET UP FOR 4000 ITERATIONS
1203  002654  012767  003004  012536        MOV     #3$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1204  002662  012777  004000  012466        MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1205  002670  012777  002770  012502        MOV     #2$,@DHRVEC             ;SET UP FOR RECEIVER INTERRUPT
```

```
1206  002676  012777  000340  012476          MOV     #340,@DHRLVL
1207  002704  012777  002762  012472          MOV     #1$,@DHTVEC             ;SET UP FOR TRANSMITTER INTERRUPT
1208  002712  012777  000340  012466          MOV     #340,@DHTLVL
1209  002720  012777  001000  012430          MOV     #BIT09,@DHSCR           ;SET MAINTENANCE MODE
1210  002726  052777  020000  012422          BIS     #BIT13,@DHSCR           ;SET TRANSMITTER DONE
1211                                                                          ;INTERRUPT ENABLE
1212  002734  052777  100000  012414          BIS     #BIT15,@DHSCR           ;FORCE INTERRUPT BY
1213                                                                          ;SETTING TRANSMITTER DONE
1214  002742  005067  175030                  CLR     PS                      ;ALLOW INTERRUPTS
1215  002746  000240                          NOP                             ;WINDOW FOR INTERRUPTS
1216  002750  012767  000340  175020          MOV     #340,PS                 ;NO INTERRUPT OCCURED
1217  002756  104001                          HLT     1                       ;WITH TRANSMITTER DONE INTERRUPT
1218                                                                          ;ENABLE AND TRANSMITTER DONE SET
1219                                                                          ;ERROR
1220  002760  000411                          BR      3$
1221  002762  012716  003004          1$:     MOV     #3$,(SP)                ;SET UP TO RETURN
1222  002766  000002                          RTI                             ;FROM VALID INTERRUPT
1223  002770  017705  012362          2$:     MOV     @DHSCR,R5               ;GET CONTENTS OF SYSTEM CONTROL REGISTER
1224  002774  104000                          HLT     0                       ;UNEXPECTED INTERRUPT
1225  002776  012716  003004                  MOV     #3$,(SP)                        ;SET UP TO RETURN
1226  003002  000002                          RTI                             ;FROM UNEXPECTED INTERRUPT
1227  003004  016777  012372  012366  3$:     MOV     DHRLVL,@DHRVEC          ;RESTORE TRAPCATCHER
1228  003012  005077  012364                  CLR     @DHRLVL
1229  003016  016777  012364  012360          MOV     DHTLVL,@DHTVEC
1230  003024  005077  012356                  CLR     @DHTLVL
1231  003030  104400                          SCOPE
1232
1233                                          ;NPR LOGIC TEST
1234                                          ;SET BYTE COUNT TO 1 FOR LINE 0
1235                                          ;SET BAR BIT FOR LINE 0
1236                                          ;DELAY FOR NPR
1237                                          ;VERIFY THAT BAR BIT FOR LINE 0 CLEARS
1238                                          ;VERIFY THAT TRANSMITTER DONE IS SET
1239
1240  003032  012767  000340  174736  T10:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1241  003040  012767  000020  012356          MOV     #20,ICOUNT              ;SET UP FOR 20 ITERATIONS
1242  003046  012767  003262  012344          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1243  003054  012777  004000  012274          MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
1244  003062  004767  012176                  JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
1245                                                                          ;AND BYTE COUNT MEMORY LOCATIONS
1246  003066  012777  003150  012310          MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
1247  003074  012777  000340  012304          MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
1248  003102  012777  000000  012246          MOV     #0,@DHSCR               ;SELECT LINE 0
1249  003110  012777  177777  012250          MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
1250  003116  012700  001000                  MOV     #1000,R0
1251  003122  012777  000001  012240          MOV     #1,@DHBAR               ;SET BAR BIT FOR
1252                                                                          ;LINE 0
1253  003130  052777  020000  012220          BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
1254  003136  005067  174634                  CLR     PS                      ;ALLOW INTERRUPTS
1255  003142  005300                  1$:     DEC     R0                      ;DELAY FOR NPR
1256  003144  001376                          BNE     1$
1257  003146  104001                          HLT     1                       ;NO INTERRUPT OCCURED, ERROR
1258  003150  005777  012202          2$:     TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
1259                                                                          ;DONE IS SET
1260  003154  100401                          BMI     3$
1261  003156  104002                          HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
```

```
1262  003160  005777  012204          3$:     TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 0
1263  003164  001404                          BEQ     4$
1264  003166  005005                          CLR     R5                      ;(R5)=EXPECTED DATA IN
1265                                                                          ;BUFFER ACTIVE REGISTER, 0
1266  003170  017704  012174                  MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
1267                                                                          ;BUFFER ACTIVE REGISTER
1268  003174  104000                          HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
1269  003176  022777  000001  012160  4$:     CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
1270  003204  001405                          BEQ     5$
1271  003206  017704  012152                  MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
1272                                                                          ;OF BUS ADDRESS MEMORY FOR
1273                                                                          ;LINE 0
1274  003212  012705  000001                  MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
1275                                                                          ;BUS ADDRESS MEMORY FOR
1276                                                                          ;LINE 0, 1
1277  003216  104003                          HLT     3                       ;BUS ADDRESS NOT UPDATED
1278                                                                          ;CORRECTLY, ERROR
1279  003220  005777  012142          5$:     TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
1280  003224  001416                          BEQ     6$
1281  003226  017704  012134                  MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
1282                                                                          ;COUNT FOR LINE 0
1283  003232  005005                          CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
1284                                                                          ;COUNT FOR LINE 0, 0
1285  003234  104004                          HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
1286  003236  016777  012140  012134          MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
1287  003244  005077  012132                  CLR     @DHRLVL
1288  003250  016777  012132  012126          MOV     DHTLVL,@DHTVEC
1289  003256  005077  012124                  CLR     @DHTLVL
1290  003262  012706  017102          6$:     MOV     #STACK,SP               ;RESTORE STACK
1291  003266  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
1292
1293                                          ;NPR LOGIC TEST
1294                                          ;SET BYTE COUNT TO 1 FOR LINE 1
1295                                          ;SET BAR BIT FOR LINE 1
1296                                          ;DELAY FOR NPR
1297                                          ;VERIFY THAT BAR BIT FOR LINE 1 CLEARS
1298                                          ;VERIFY THAT TRANSMITTER DONE IS SET
1299
1300  003270  012767  000340  174500  T11:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1301  003276  012767  000020  012120          MOV     #20,ICOUNT              ;SET UP FOR 20 ITERATIONS
1302  003304  012767  003520  012106          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1303  003312  012777  004000  012036          MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
1304  003320  004767  011740                  JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
1305                                                                          ;AND BYTE COUNT MEMORY LOCATIONS
1306  003324  012777  003406  012052          MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
1307  003332  012777  000340  012046          MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
1308  003340  012777  000001  012010          MOV     #1,@DHSCR               ;SELECT LINE 1
1309  003346  012777  177777  012012          MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
1310  003354  012700  001000                  MOV     #1000,R0
1311  003360  012777  000002  012002          MOV     #2,@DHBAR               ;SET BAR BIT FOR
1312                                                                          ;LINE 1
1313  003366  052777  020000  011762          BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
1314  003374  005067  174376                  CLR     PS                      ;ALLOW INTERRUPTS
1315  003400  005300                  1$:     DEC     R0                      ;DELAY FOR NPR
1316  003402  001376                          BNE     1$
1317  003404  104001                          HLT     1                       ;NO INTERRUPT OCCURED, ERROR
```

```
1318  003406  005777  011744          2$:     TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
1319                                                                          ;DONE IS SET
1320  003412  100401                          BMI     3$
1321  003414  104002                          HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
1322  003416  005777  011746          3$:     TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 1
1323  003422  001404                          BEQ     4$
1324  003424  005005                          CLR     R5                      ;(R5)=EXPECTED DATA IN
1325                                                                          ;BUFFER ACTIVE REGISTER, 0
1326  003426  017704  011736                  MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
1327                                                                          ;BUFFER ACTIVE REGISTER
1328  003432  104000                          HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
1329  003434  022777  000001  011722  4$:     CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
1330  003442  001405                          BEQ     5$
1331  003444  017704  011714                  MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
1332                                                                          ;OF BUS ADDRESS MEMORY FOR
1333                                                                          ;LINE 1
1334  003450  012705  000001                  MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
1335                                                                          ;BUS ADDRESS MEMORY FOR
1336                                                                          ;LINE 1, 1
1337  003454  104003                          HLT     3                       ;BUS ADDRESS NOT UPDATED
1338                                                                          ;CORRECTLY, ERROR
1339  003456  005777  011704          5$:     TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
1340  003462  001416                          BEQ     6$
1341  003464  017704  011676                  MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
1342                                                                          ;COUNT FOR LINE 1
1343  003470  005005                          CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
1344                                                                          ;COUNT FOR LINE 1, 0
1345  003472  104004                          HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
1346  003474  016777  011702  011676          MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
1347  003502  005077  011674                  CLR     @DHRLVL
1348  003506  016777  011674  011670          MOV     DHTLVL,@DHTVEC
1349  003514  005077  011666                  CLR     @DHTLVL
1350  003520  012706  017102          6$:     MOV     #STACK,SP               ;RESTORE STACK
1351  003524  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
1352
1353                                          ;NPR LOGIC TEST
1354                                          ;SET BYTE COUNT TO 1 FOR LINE 2
1355                                          ;SET BAR BIT FOR LINE 2
1356                                          ;DELAY FOR NPR
1357                                          ;VERIFY THAT BAR BIT FOR LINE 2 CLEARS
1358                                          ;VERIFY THAT TRANSMITTER DONE IS SET
1359
1360  003526  012767  000340  174242  T12:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1361  003534  012767  000020  011662          MOV     #20,ICOUNT              ;SET UP FOR 20 ITERATIONS
1362  003542  012767  003756  011650          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1363  003550  012777  004000  011600          MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
1364  003556  004767  011502                  JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
1365                                                                          ;AND BYTE COUNT MEMORY LOCATIONS
1366  003562  012777  003644  011614          MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
1367  003570  012777  000340  011610          MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
1368  003576  012777  000002  011552          MOV     #2,@DHSCR               ;SELECT LINE 2
1369  003604  012777  177777  011554          MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
1370  003612  012700  001000                  MOV     #1000,R0
1371  003616  012777  000004  011544          MOV     #4,@DHBAR               ;SET BAR BIT FOR
1372                                                                          ;LINE 2
1373  003624  052777  020000  011524          BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
```

```
1374  003632  005067  174140          CLR     PS                      ;ALLOW INTERRUPTS
1375  003636  005300                1$: DEC     R0                      ;DELAY FOR NPR
1376  003640  001376                    BNE     1$
1377  003642  104001                    HLT     1                       ;NO INTERRUPT OCCURED, ERROR
1378  003644  005777  011506        2$: TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
1379                                                                    ;DONE IS SET
1380  003650  100401                    BMI     3$
1381  003652  104002                    HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
1382  003654  005777  011510        3$: TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 2
1383  003660  001404                    BEQ     4$
1384  003662  005005                    CLR     R5                      ;(R5)=EXPECTED DATA IN
1385                                                                    ;BUFFER ACTIVE REGISTER, 0
1386  003664  017704  011500            MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
1387                                                                    ;BUFFER ACTIVE REGISTER
1388  003670  104000                    HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
1389  003672  022777  000001  011464  4$: CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
1390  003700  001405                    BEQ     5$
1391  003702  017704  011456            MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
1392                                                                    ;OF BUS ADDRESS MEMORY FOR
1393                                                                    ;LINE 2
1394  003706  012705  000001            MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
1395                                                                    ;BUS ADDRESS MEMORY FOR
1396                                                                    ;LINE 2, 1
1397  003712  104003                    HLT     3                       ;BUS ADDRESS NOT UPDATED
1398                                                                    ;CORRECTLY, ERROR
1399  003714  005777  011446        5$: TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
1400  003720  001416                    BEQ     6$
1401  003722  017704  011440            MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
1402                                                                    ;COUNT FOR LINE 2
1403  003726  005005                    CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
1404                                                                    ;COUNT FOR LINE 2, 0
1405  003730  104004                    HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
1406  003732  016777  011444  011440    MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
1407  003740  005077  011436            CLR     @DHRLVL
1408  003744  016777  011436  011432    MOV     DHTLVL,@DHTVEC
1409  003752  005077  011430            CLR     @DHTLVL
1410  003756  012706  017102        6$: MOV     #STACK,SP               ;RESTORE STACK
1411  003762  104400                    SCOPE                           ;CHECK FOR ITERATIONS, LOOP
1412
1413                                    ;NPR LOGIC TEST
1414                                    ;SET BYTE COUNT TO 1 FOR LINE 3
1415                                    ;SET BAR BIT FOR LINE 3
1416                                    ;DELAY FOR NPR
1417                                    ;VERIFY THAT BAR BIT FOR LINE 3 CLEARS
1418                                    ;VERIFY THAT TRANSMITTER DONE IS SET
1419
1420  003764  012767  000340  174004  T13: MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1421  003772  012767  000020  011424      MOV     #20.,ICOUNT             ;SET UP FOR 20 ITERATIONS
1422  004000  012767  004214  011412      MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1423  004006  012777  004000  011342      MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
1424  004014  004767  011244              JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
1425                                                                    ;AND BYTE COUNT MEMORY LOCATIONS
1426  004020  012777  004102  011356      MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
1427  004026  012777  000340  011352      MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
1428  004034  012777  000003  011314      MOV     #3,@DHSCR               ;SELECT LINE 3
1429  004042  012777  177777  011316      MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
```

```
1430  004050  012700  001000                MOV     #1000,R0
1431  004054  012777  000010  011306        MOV     #10,@DHBAR              ;SET BAR BIT FOR
1432                                                                        ;LINE 3
1433  004062  052777  020000  011266        BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
1434  004070  005067  173702                CLR     PS                      ;ALLOW INTERRUPTS
1435  004074  005300                1$:     DEC     R0                      ;DELAY FOR NPR
1436  004076  001376                        BNE     1$
1437  004100  104001                        HLT     1                       ;NO INTERRUPT OCCURED, ERROR
1438  004102  005777  011250          2$:   TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
1439                                                                        ;DONE IS SET
1440  004106  100401                        BMI     3$
1441  004110  104002                        HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
1442  004112  005777  011252          3$:   TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 3
1443  004116  001404                        BEQ     4$
1444  004120  005005                        CLR     R5                      ;(R5)=EXPECTED DATA IN
1445                                                                        ;BUFFER ACTIVE REGISTER, 0
1446  004122  017704  011242                MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
1447                                                                        ;BUFFER ACTIVE REGISTER
1448  004126  104000                        HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
1449  004130  022777  000001  011226  4$:   CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
1450  004136  001405                        BEQ     5$
1451  004140  017704  011220                MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
1452                                                                        ;OF BUS ADDRESS MEMORY FOR
1453                                                                        ;LINE 3
1454  004144  012705  000001                MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
1455                                                                        ;BUS ADDRESS MEMORY FOR
1456                                                                        ;LINE 3, 1
1457  004150  104003                        HLT     3                       ;BUS ADDRESS NOT UPDATED
1458                                                                        ;CORRECTLY, ERROR
1459  004152  005777  011210          5$:   TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
1460  004156  001416                        BEQ     6$
1461  004160  017704  011202                MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
1462                                                                        ;COUNT FOR LINE 3
1463  004164  005005                        CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
1464                                                                        ;COUNT FOR LINE 3, 0
1465  004166  104004                        HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
1466  004170  016777  011206  011202        MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
1467  004176  005077  011200                CLR     @DHRLVL
1468  004202  016777  011200  011174        MOV     DHTLVL,@DHTVEC
1469  004210  005077  011172                CLR     @DHTLVL
1470  004214  012706  017102          6$:   MOV     #STACK,SP               ;RESTORE STACK
1471  004220  104400                        SCOPE                           ;CHECK FOR ITERATIONS, LOOP
1472
1473                                        ;NPR LOGIC TEST
1474                                        ;SET BYTE COUNT TO 1 FOR LINE 4
1475                                        ;SET BAR BIT FOR LINE 4
1476                                        ;DELAY FOR NPR
1477                                        ;VERIFY THAT BAR BIT FOR LINE 4 CLEARS
1478                                        ;VERIFY THAT TRANSMITTER DONE IS SET
1479
1480  004222  012767  000340  173546  T14:   MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1481  004230  012767  000020  011166        MOV     #20,ICOUNT              ;SET UP FOR 20 ITERATIONS
1482  004236  012767  004452  011154        MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1483  004244  012777  004000  011104        MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
1484  004252  004767  011006                JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
1485                                                                        ;AND BYTE COUNT MEMORY LOCATIONS
```

```
1486  004256  012777  004340  011120          MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
1487  004264  012777  000340  011114          MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
1488  004272  012777  000004  011056          MOV     #4,@DHSCR               ;SELECT LINE 4
1489  004300  012777  177777  011060          MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
1490  004306  012700  001000                  MOV     #1000,R0
1491  004312  012777  000020  011050          MOV     #20,@DHBAR              ;SET BAR BIT FOR
1492                                                                          ;LINE 4
1493  004320  052777  020000  011030          BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
1494  004326  005067  173444                  CLR     PS                      ;ALLOW INTERRUPTS
1495  004332  005300                  1$:     DEC     R0                      ;DELAY FOR NPR
1496  004334  001376                          BNE     1$
1497  004336  104001                          HLT     1                       ;NO INTERRUPT OCCURED, ERROR
1498  004340  005777  011012          2$:     TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
1499                                                                          ;DONE IS SET
1500  004344  100401                          BMI     3$
1501  004346  104002                          HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
1502  004350  005777  011014          3$:     TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 4
1503  004354  001404                          BEQ     4$
1504  004356  005005                          CLR     R5                      ;(R5)=EXPECTED DATA IN
1505                                                                          ;BUFFER ACTIVE REGISTER, 0
1506  004360  017704  011004                  MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
1507                                                                          ;BUFFER ACTIVE REGISTER
1508  004364  104000                          HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
1509  004366  022777  000001  010770  4$:     CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
1510  004374  001405                          BEQ     5$
1511  004376  017704  010762                  MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
1512                                                                          ;OF BUS ADDRESS MEMORY FOR
1513                                                                          ;LINE 4
1514  004402  012705  000001                  MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
1515                                                                          ;BUS ADDRESS MEMORY FOR
1516                                                                          ;LINE 4, 1
1517  004406  104003                          HLT     3                       ;BUS ADDRESS NOT UPDATED
1518                                                                          ;CORRECTLY, ERROR
1519  004410  005777  010752          5$:     TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
1520  004414  001416                          BEQ     6$
1521  004416  017704  010744                  MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
1522                                                                          ;COUNT FOR LINE 4
1523  004422  005005                          CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
1524                                                                          ;COUNT FOR LINE 4, 0
1525  004424  104004                          HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
1526  004426  016777  010750  010744          MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
1527  004434  005077  010742                  CLR     @DHRLVL
1528  004440  016777  010742  010736          MOV     DHTLVL,@DHTVEC
1529  004446  005077  010734                  CLR     @DHTLVL
1530  004452  012706  017102          6$:     MOV     #STACK,SP               ;RESTORE STACK
1531  004456  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
1532
1533                                          ;NPR LOGIC TEST
1534                                          ;SET BYTE COUNT TO 1 FOR LINE 5
1535                                          ;SET BAR BIT FOR LINE 5
1536                                          ;DELAY FOR NPR
1537                                          ;VERIFY THAT BAR BIT FOR LINE 5 CLEARS
1538                                          ;VERIFY THAT TRANSMITTER DONE IS SET
1539
1540  004460  012767  000340  173310  T15:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1541  004466  012767  000020  010730          MOV     #20,ICOUNT              ;SET UP FOR 20 ITERATIONS
```

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1542  004474  012767  004710  010716          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1543  004502  012777  004000  010646          MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
1544  004510  004767  010550                  JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
1545                                                                          ;AND BYTE COUNT MEMORY LOCATIONS
1546  004514  012777  004576  010662          MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
1547  004522  012777  000340  010656          MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
1548  004530  012777  000005  010620          MOV     #5,@DHSCR               ;SELECT LINE 5
1549  004536  012777  177777  010622          MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
1550  004544  012700  001000                  MOV     #1000,R0
1551  004550  012777  000040  010612          MOV     #40,@DHBAR              ;SET BAR BIT FOR
1552                                                                          ;LINE 5
1553  004556  052777  020000  010572          BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
1554  004564  005067  173206                  CLR     PS                      ;ALLOW INTERRUPTS
1555  004570  005300                  1$:     DEC     R0                      ;DELAY FOR NPR
1556  004572  001376                          BNE     1$
1557  004574  104001                          HLT     1                       ;NO INTERRUPT OCCURED, ERROR
1558  004576  005777  010554          2$:     TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
1559                                                                          ;DONE IS SET
1560  004602  100401                          BMI     3$
1561  004604  104002                          HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
1562  004606  005777  010556          3$:     TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 5
1563  004612  001404                          BEQ     4$
1564  004614  005005                          CLR     R5                      ;(R5)=EXPECTED DATA IN
1565                                                                          ;BUFFER ACTIVE REGISTER, 0
1566  004616  017704  010546                  MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
1567                                                                          ;BUFFER ACTIVE REGISTER
1568  004622  104000                          HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
1569  004624  022777  000001  010532  4$:     CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
1570  004632  001405                          BEQ     5$
1571  004634  017704  010524                  MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
1572                                                                          ;OF BUS ADDRESS MEMORY FOR
1573                                                                          ;LINE 5
1574  004640  012705  000001                  MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
1575                                                                          ;BUS ADDRESS MEMORY FOR
1576                                                                          ;LINE 5, 1
1577  004644  104003                          HLT     3                       ;BUS ADDRESS NOT UPDATED
1578                                                                          ;CORRECTLY, ERROR
1579  004646  005777  010514          5$:     TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
1580  004652  001416                          BEQ     6$
1581  004654  017704  010506                  MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
1582                                                                          ;COUNT FOR LINE 5
1583  004660  005005                          CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
1584                                                                          ;COUNT FOR LINE 5, 0
1585  004662  104004                          HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
1586  004664  016777  010512  010506          MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
1587  004672  005077  010504                  CLR     @DHRLVL
1588  004676  016777  010504  010500          MOV     DHTLVL,@DHTVEC
1589  004704  005077  010476                  CLR     @DHTLVL
1590  004710  012706  017102          6$:     MOV     #STACK,SP               ;RESTORE STACK
1591  004714  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
1592
1593                                          ;NPR LOGIC TEST
1594                                          ;SET BYTE COUNT TO 1 FOR LINE 6
1595                                          ;SET BAR BIT FOR LINE 6
1596                                          ;DELAY FOR NPR
1597                                          ;VERIFY THAT BAR BIT FOR LINE 6 CLEARS
```

```
1598                                                    ;VERIFY THAT TRANSMITTER DONE IS SET
1599
1600  004716  012767  000340  173052  T16:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1601  004724  012767  000020  010472          MOV     #20.,ICOUNT             ;SET UP FOR 20 ITERATIONS
1602  004732  012767  005146  010460          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1603  004740  012777  004000  010410          MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
1604  004746  004767  010312                  JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
1605                                                                          ;AND BYTE COUNT MEMORY LOCATIONS
1606  004752  012777  005034  010424          MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
1607  004760  012777  000340  010420          MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
1608  004766  012777  000006  010362          MOV     #6,@DHSCR               ;SELECT LINE 6
1609  004774  012777  177777  010364          MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
1610  005002  012700  001000                  MOV     #1000,R0
1611  005006  012777  000100  010354          MOV     #100,@DHBAR             ;SET BAR BIT FOR
1612                                                                          ;LINE 6
1613  005014  052777  020000  010334          BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
1614  005022  005067  172750                  CLR     PS                      ;ALLOW INTERRUPTS
1615  005026  005300                  1$:     DEC     R0                      ;DELAY FOR NPR
1616  005030  001376                          BNE     1$
1617  005032  104001                          HLT     1                       ;NO INTERRUPT OCCURED, ERROR
1618  005034  005777  010316          2$:     TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
1619                                                                          ;DONE IS SET
1620  005040  100401                          BMI     3$
1621  005042  104002                          HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
1622  005044  005777  010320          3$:     TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 6
1623  005050  001404                          BEQ     4$
1624  005052  005005                          CLR     R5                      ;(R5)=EXPECTED DATA IN
1625                                                                          ;BUFFER ACTIVE REGISTER, 0
1626  005054  017704  010310                  MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
1627                                                                          ;BUFFER ACTIVE REGISTER
1628  005060  104000                          HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
1629  005062  022777  000001  010274  4$:     CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
1630  005070  001405                          BEQ     5$
1631  005072  017704  010266                  MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
1632                                                                          ;OF BUS ADDRESS MEMORY FOR
1633                                                                          ;LINE 6
1634  005076  012705  000001                  MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
1635                                                                          ;BUS ADDRESS MEMORY FOR
1636                                                                          ;LINE 6, 1
1637  005102  104003                          HLT     3                       ;BUS ADDRESS NOT UPDATED
1638                                                                          ;CORRECTLY, ERROR
1639  005104  005777  010256          5$:     TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
1640  005110  001416                          BEQ     6$
1641  005112  017704  010250                  MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
1642                                                                          ;COUNT FOR LINE 6
1643  005116  005005                          CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
1644                                                                          ;COUNT FOR LINE 6, 0
1645  005120  104004                          HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
1646  005122  016777  010254  010250          MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
1647  005130  005077  010246                  CLR     @DHRLVL
1648  005134  016777  010246  010242          MOV     DHTLVL,@DHTVEC
1649  005142  005077  010240                  CLR     @DHTLVL
1650  005146  012706  017102          6$:     MOV     #STACK,SP               ;RESTORE STACK
1651  005152  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
1652
1653                                                    ;NPR LOGIC TEST
```

```
1654                                            ;SET BYTE COUNT TO 1 FOR LINE 7
1655                                            ;SET BAR BIT FOR LINE 7
1656                                            ;DELAY FOR NPR
1657                                            ;VERIFY THAT BAR BIT FOR LINE 7 CLEARS
1658                                            ;VERIFY THAT TRANSMITTER DONE IS SET
1659
1660  005154  012767  000340  172614  T17:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1661  005162  012767  000020  010234          MOV     #20,ICOUNT              ;SET UP FOR 20 ITERATIONS
1662  005170  012767  005404  010222          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1663  005176  012777  004000  010152          MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
1664  005204  004767  010054                  JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
1665                                                                          ;AND BYTE COUNT MEMORY LOCATIONS
1666  005210  012777  005272  010166          MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
1667  005216  012777  000340  010162          MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
1668  005224  012777  000007  010124          MOV     #7,@DHSCR               ;SELECT LINE 7
1669  005232  012777  177777  010126          MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
1670  005240  012700  001000                  MOV     #1000,R0
1671  005244  012777  000200  010116          MOV     #200,@DHBAR             ;SET BAR BIT FOR
1672                                                                          ;LINE 7
1673  005252  052777  020000  010076          BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
1674  005260  005067  172512                  CLR     PS                      ;ALLOW INTERRUPTS
1675  005264  005300                  1$:     DEC     R0                      ;DELAY FOR NPR
1676  005266  001376                          BNE     1$
1677  005270  104001                          HLT     1                       ;NO INTERRUPT OCCURED, ERROR
1678  005272  005777  010060          2$:     TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
1679                                                                          ;DONE IS SET
1680  005276  100401                          BMI     3$
1681  005300  104002                          HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
1682  005302  005777  010062          3$:     TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 7
1683  005306  001404                          BEQ     4$
1684  005310  005005                          CLR     R5                      ;(R5)=EXPECTED DATA IN
1685                                                                          ;BUFFER ACTIVE REGISTER, 0
1686  005312  017704  010052                  MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
1687                                                                          ;BUFFER ACTIVE REGISTER
1688  005316  104000                          HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
1689  005320  022777  000001  010036  4$:     CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
1690  005326  001405                          BEQ     5$
1691  005330  017704  010030                  MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
1692                                                                          ;OF BUS ADDRESS MEMORY FOR
1693                                                                          ;LINE 7
1694  005334  012705  000001                  MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
1695                                                                          ;BUS ADDRESS MEMORY FOR
1696                                                                          ;LINE 7, 1
1697  005340  104003                          HLT     3                       ;BUS ADDRESS NOT UPDATED
1698                                                                          ;CORRECTLY, ERROR
1699  005342  005777  010020          5$:     TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
1700  005346  001416                          BEQ     6$
1701  005350  017704  010012                  MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
1702                                                                          ;COUNT FOR LINE 7
1703  005354  005005                          CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
1704                                                                          ;COUNT FOR LINE 7, 0
1705  005356  104004                          HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
1706  005360  016777  010016  010012          MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
1707  005366  005077  010010                  CLR     @DHRLVL
1708  005372  016777  010010  010004          MOV     DHTLVL,@DHTVEC
1709  005400  005077  010002                  CLR     @DHTLVL
```

```
1710  005404  012706  017102          6$:     MOV     #STACK,SP               ;RESTORE STACK
1711  005410  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
1712
1713                                          ;NPR LOGIC TEST
1714                                          ;SET BYTE COUNT TO 1 FOR LINE 10
1715                                          ;SET BAR BIT FOR LINE 10
1716                                          ;DELAY FOR NPR
1717                                          ;VERIFY THAT BAR BIT FOR LINE 10 CLEARS
1718                                          ;VERIFY THAT TRANSMITTER DONE IS SET
1719
1720  005412  012767  000340  172356  T20:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1721  005420  012767  000020  007776          MOV     #20,ICOUNT              ;SET UP FOR 20 ITERATIONS
1722  005426  012767  005642  007764          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1723  005434  012777  004000  007714          MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
1724  005442  004767  007616                  JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
1725                                                                          ;AND BYTE COUNT MEMORY LOCATIONS
1726  005446  012777  005530  007730          MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
1727  005454  012777  000340  007724          MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
1728  005462  012777  000010  007666          MOV     #10,@DHSCR              ;SELECT LINE 10
1729  005470  012777  177777  007670          MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
1730  005476  012700  001000                  MOV     #1000,R0
1731  005502  012777  000400  007660          MOV     #400,@DHBAR             ;SET BAR BIT FOR
1732                                                                          ;LINE 10
1733  005510  052777  020000  007640          BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
1734  005516  005067  172254                  CLR     PS                      ;ALLOW INTERRUPTS
1735  005522  005300                  1$:     DEC     R0                      ;DELAY FOR NPR
1736  005524  001376                          BNE     1$
1737  005526  104001                          HLT     1                       ;NO INTERRUPT OCCURED, ERROR
1738  005530  005777  007622          2$:     TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
1739                                                                          ;DONE IS SET
1740  005534  100401                          BMI     3$
1741  005536  104002                          HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
1742  005540  005777  007624          3$:     TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 10
1743  005544  001404                          BEQ     4$
1744  005546  005005                          CLR     R5                      ;(R5)=EXPECTED DATA IN
1745                                                                          ;BUFFER ACTIVE REGISTER, 0
1746  005550  017704  007614                  MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
1747                                                                          ;BUFFER ACTIVE REGISTER
1748  005554  104000                          HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
1749  005556  022777  000001  007600  4$:     CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
1750  005564  001405                          BEQ     5$
1751  005566  017704  007572                  MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
1752                                                                          ;OF BUS ADDRESS MEMORY FOR
1753                                                                          ;LINE 10
1754  005572  012705  000001                  MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
1755                                                                          ;BUS ADDRESS MEMORY FOR
1756                                                                          ;LINE 10, 1
1757  005576  104003                          HLT     3                       ;BUS ADDRESS NOT UPDATED
1758                                                                          ;CORRECTLY, ERROR
1759  005600  005777  007562          5$:     TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
1760  005604  001416                          BEQ     6$
1761  005606  017704  007554                  MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
1762                                                                          ;COUNT FOR LINE 10
1763  005612  005005                          CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
1764                                                                          ;COUNT FOR LINE 10, 0
1765  005614  104004                          HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
```

```
1766  005616  016777  007560  007554          MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
1767  005624  005077  007552                  CLR     @DHRLVL
1768  005630  016777  007552  007546          MOV     DHTLVL,@DHTVEC
1769  005636  005077  007544                  CLR     @DHTLVL
1770  005642  012706  017102          6$:     MOV     #STACK,SP               ;RESTORE STACK
1771  005646  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
1772
1773                                          ;NPR LOGIC TEST
1774                                          ;SET BYTE COUNT TO 1 FOR LINE 11
1775                                          ;SET BAR BIT FOR LINE 11
1776                                          ;DELAY FOR NPR
1777                                          ;VERIFY THAT BAR BIT FOR LINE 11 CLEARS
1778                                          ;VERIFY THAT TRANSMITTER DONE IS SET
1779
1780  005650  012767  000340  172120  T21:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1781  005656  012767  000020  007540          MOV     #20,ICOUNT              ;SET UP FOR 20 ITERATIONS
1782  005664  012767  006100  007526          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1783  005672  012777  004000  007456          MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
1784  005700  004767  007360                  JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
1785                                                                          ;AND BYTE COUNT MEMORY LOCATIONS
1786  005704  012777  005766  007472          MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
1787  005712  012777  000340  007466          MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
1788  005720  012777  000011  007430          MOV     #11,@DHSCR              ;SELECT LINE 11
1789  005726  012777  177777  007432          MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
1790  005734  012700  001000                  MOV     #1000,R0
1791  005740  012777  001000  007422          MOV     #1000,@DHBAR            ;SET BAR BIT FOR
1792                                                                          ;LINE 11
1793  005746  052777  020000  007402          BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
1794  005754  005067  172016                  CLR     PS                      ;ALLOW INTERRUPTS
1795  005760  005300                  1$:     DEC     R0                      ;DELAY FOR NPR
1796  005762  001376                          BNE     1$
1797  005764  104001                          HLT     1                       ;NO INTERRUPT OCCURED, ERROR
1798  005766  005777  007364          2$:     TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
1799                                                                          ;DONE IS SET
1800  005772  100401                          BMI     3$
1801  005774  104002                          HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
1802  005776  005777  007366          3$:     TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 11
1803  006002  001404                          BEQ     4$
1804  006004  005005                          CLR     R5                      ;(R5)=EXPECTED DATA IN
1805                                                                          ;BUFFER ACTIVE REGISTER, 0
1806  006006  017704  007356                  MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
1807                                                                          ;BUFFER ACTIVE REGISTER
1808  006012  104000                          HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
1809  006014  022777  000001  007342  4$:     CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
1810  006022  001405                          BEQ     5$
1811  006024  017704  007334                  MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
1812                                                                          ;OF BUS ADDRESS MEMORY FOR
1813                                                                          ;LINE 11
1814  006030  012705  000001                  MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
1815                                                                          ;BUS ADDRESS MEMORY FOR
1816                                                                          ;LINE 11, 1
1817  006034  104003                          HLT     3                       ;BUS ADDRESS NOT UPDATED
1818                                                                          ;CORRECTLY, ERROR
1819  006036  005777  007324          5$:     TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
1820  006042  001416                          BEQ     6$
1821  006044  017704  007316                  MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
```

```
1822
1823  006050  005005                          CLR     R5                      ;COUNT FOR LINE 11
1824                                                                          ;(R5)=EXPECTED VALUE OF BYTE
1825  006052  104004                          HLT     4                       ;COUNT FOR LINE 11, 0
1826  006054  016777  007322  007316          MOV     DHRLVL,@DHRVEC  ;RESTORE BYTE COUNT DID NOT DECREMENT TO 0, ERROR
1827  006062  005077  007314                  CLR     @DHRLVL         ;RESTORE TRAPCATCHER
1828  006066  016777  007314  007310          MOV     DHTLVL,@DHTVEC
1829  006074  005077  007306                  CLR     @DHTLVL
1830  006100  012706  017102          6$:     MOV     #STACK,SP               ;RESTORE STACK
1831  006104  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
1832
1833                                          ;NPR LOGIC TEST
1834                                          ;SET BYTE COUNT TO 1 FOR LINE 12
1835                                          ;SET BAR BIT FOR LINE 12
1836                                          ;DELAY FOR NPR
1837                                          ;VERIFY THAT BAR BIT FOR LINE 12 CLEARS
1838                                          ;VERIFY THAT TRANSMITTER DONE IS SET
1839
1840  006106  012767  000340  171662  T22:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1841  006114  012767  000020  007302          MOV     #20,ICOUNT              ;SET UP FOR 20 ITERATIONS
1842  006122  012767  006336  007270          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1843  006130  012777  004000  007220          MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
1844  006136  004767  007122                  JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
1845                                                                          ;AND BYTE COUNT MEMORY LOCATIONS
1846  006142  012777  006224  007234          MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
1847  006150  012777  000340  007230          MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
1848  006156  012777  000012  007172          MOV     #12,@DHSCR              ;SELECT LINE 12
1849  006164  012777  177777  007174          MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
1850  006172  012700  001000                  MOV     #1000,R0
1851  006176  012777  002000  007164          MOV     #2000,@DHBAR            ;SET BAR BIT FOR
1852                                                                          ;LINE 12
1853  006204  052777  020000  007144          BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
1854  006212  005067  171560                  CLR     PS                      ;ALLOW INTERRUPTS
1855  006216  005300                  1$:     DEC     R0                      ;DELAY FOR NPR
1856  006220  001376                          BNE     1$
1857  006222  104001                          HLT     1                       ;NO INTERRUPT OCCURED, ERROR
1858  006224  005777  007126          2$:     TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
1859                                                                          ;DONE IS SET
1860  006230  100401                          BMI     3$
1861  006232  104002                          HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
1862  006234  005777  007130          3$:     TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 12
1863  006240  001404                          BEQ     4$
1864  006242  005005                          CLR     R5                      ;(R5)=EXPECTED DATA IN
1865                                                                          ;BUFFER ACTIVE REGISTER, 0
1866  006244  017704  007120                  MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
1867                                                                          ;BUFFER ACTIVE REGISTER
1868  006250  104000                          HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
1869  006252  022777  000001  007104  4$:     CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
1870  006260  001405                          BEQ     5$
1871  006262  017704  007076                  MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
1872                                                                          ;OF BUS ADDRESS MEMORY FOR
1873                                                                          ;LINE 12
1874  006266  012705  000001                  MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
1875                                                                          ;BUS ADDRESS MEMORY FOR
1876                                                                          ;LINE 12, 1
1877  006272  104003                          HLT     3                       ;BUS ADDRESS NOT UPDATED
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1878                                                                    ;CORRECTLY, ERROR
1879  006274  005777  007066          5$:     TST     @DHBC             ;DID BYTE COUNT DECREMENT TO 0
1880  006300  001416                          BEQ     6$
1881  006302  017704  007060                  MOV     @DHBC,R4          ;(R4)=ACTUAL VALUE OF BYTE
1882                                                                    ;COUNT FOR LINE 12
1883  006306  005005                          CLR     R5                ;(R5)=EXPECTED VALUE OF BYTE
1884                                                                    ;COUNT FOR LINE 12, 0
1885  006310  104004                          HLT     4                 ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
1886  006312  016777  007064  007060          MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
1887  006320  005077  007056                  CLR     @DHRLVL
1888  006324  016777  007056  007052          MOV     DHTLVL,@DHTVEC
1889  006332  005077  007050                  CLR     @DHTLVL
1890  006336  012706  017102          6$:     MOV     #STACK,SP         ;RESTORE STACK
1891  006342  104400                          SCOPE                     ;CHECK FOR ITERATIONS, LOOP
1892
1893                                          ;NPR LOGIC TEST
1894                                          ;SET BYTE COUNT TO 1 FOR LINE 13
1895                                          ;SET BAR BIT FOR LINE 13
1896                                          ;DELAY FOR NPR
1897                                          ;VERIFY THAT BAR BIT FOR LINE 13 CLEARS
1898                                          ;VERIFY THAT TRANSMITTER DONE IS SET
1899
1900  006344  012767  000340  171424  T23:     MOV     #340,PS           ;DISABLE ALL INTERRUPTS
1901  006352  012767  000020  007044          MOV     #20,ICOUNT        ;SET UP FOR 20 ITERATIONS
1902  006360  012767  006574  007032          MOV     #6$,ESCAPE        ;SET UP TO ESCAPE TO NEXT TEST
1903  006366  012777  004000  006762          MOV     #BIT11,@DHSCR     ;ISSUE MASTER CLEAR
1904  006374  004767  006664                  JSR     PC,CLEAR          ;CLEAR ALL BUS ADDRESS
1905                                                                    ;AND BYTE COUNT MEMORY LOCATIONS
1906  006400  012777  006462  006776          MOV     #2$,@DHTVEC       ;SET UP TRANSMITTER
1907  006406  012777  000340  006772          MOV     #340,@DHTLVL      ;INTERRUPT VECTOR
1908  006414  012777  000013  006734          MOV     #13,@DHSCR        ;SELECT LINE 13
1909  006422  012777  177777  006736          MOV     #-1,@DHBC         ;SET BYTE COUNT TO 1
1910  006430  012700  001000                  MOV     #1000,R0
1911  006434  012777  004000  006726          MOV     #4000,@DHBAR      ;SET BAR BIT FOR
1912                                                                    ;LINE 13
1913  006442  052777  020000  006706          BIS     #BIT13,@DHSCR     ;SET TRANSMITTER INTERRUPT ENABLE
1914  006450  005067  171322                  CLR     PS                ;ALLOW INTERRUPTS
1915  006454  005300                  1$:     DEC     R0                ;DELAY FOR NPR
1916  006456  001376                          BNE     1$
1917  006460  104001                          HLT     1                 ;NO INTERRUPT OCCURED, ERROR
1918  006462  005777  006670          2$:     TST     @DHSCR            ;VERIFY THAT TRANSMITTER
1919                                                                    ;DONE IS SET
1920  006466  100401                          BMI     3$
1921  006470  104002                          HLT     2                 ;TRANSMITTER DONE NOT SET, ERROR
1922  006472  005777  006672          3$:     TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 13
1923  006476  001404                          BEQ     4$
1924  006500  005005                          CLR     R5                ;(R5)=EXPECTED DATA IN
1925                                                                    ;BUFFER ACTIVE REGISTER, 0
1926  006502  017704  006662                  MOV     @DHBAR,R4         ;(R4)=ACTUAL CONTENTS OF
1927                                                                    ;BUFFER ACTIVE REGISTER
1928  006506  104000                          HLT     0                 ;BUS ACTIVE BIT NOT CLEARED, ERROR
1929  006510  022777  000001  006646  4$:     CMP     #1,@DHBA          ;WAS BUS ADDRESS INCREMENTED
1930  006516  001405                          BEQ     5$
1931  006520  017704  006640                  MOV     @DHBA,R4          ;(R4)=ACTUAL CONTENTS
1932                                                                    ;OF BUS ADDRESS MEMORY FOR
1933                                                                    ;LINE 13
```

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 1934  006524  012705  000001                  MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
 1935                                                                          ;BUS ADDRESS MEMORY FOR
 1936                                                                          ;LINE 13, 1
 1937  006530  104003                          HLT     3                       ;BUS ADDRESS NOT UPDATED
 1938                                                                          ;CORRECTLY, ERROR
 1939  006532  005777  006630          5$:     TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
 1940  006536  001416                          BEQ     6$
 1941  006540  017704  006622                  MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
 1942                                                                          ;COUNT FOR LINE 13
 1943  006544  005005                          CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
 1944                                                                          ;COUNT FOR LINE 13, 0
 1945  006546  104004                          HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
 1946  006550  016777  006626  006622          MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
 1947  006556  005077  006620                  CLR     @DHRLVL
 1948  006562  016777  006620  006614          MOV     DHTLVL,@DHTVEC
 1949  006570  005077  006612                  CLR     @DHTLVL
 1950  006574  012706  017102          6$:     MOV     #STACK,SP               ;RESTORE STACK
 1951  006600  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
 1952
 1953                                          ;NPR LOGIC TEST
 1954                                          ;SET BYTE COUNT TO 1 FOR LINE 14
 1955                                          ;SET BAR BIT FOR LINE 14
 1956                                          ;DELAY FOR NPR
 1957                                          ;VERIFY THAT BAR BIT FOR LINE 14 CLEARS
 1958                                          ;VERIFY THAT TRANSMITTER DONE IS SET
 1959
 1960  006602  012767  000340  171166  T24:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
 1961  006610  012767  000020  006606          MOV     #20,ICOUNT              ;SET UP FOR 20 ITERATIONS
 1962  006616  012767  007032  006574          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
 1963  006624  012777  004000  006524          MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
 1964  006632  004767  006426                  JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
 1965                                                                          ;AND BYTE COUNT MEMORY LOCATIONS
 1966  006636  012777  006720  006540          MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
 1967  006644  012777  000340  006534          MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
 1968  006652  012777  000014  006476          MOV     #14,@DHSCR              ;SELECT LINE 14
 1969  006660  012777  177777  006500          MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
 1970  006666  012700  001000                  MOV     #1000,R0
 1971  006672  012777  010000  006470          MOV     #10000,@DHBAR           ;SET BAR BIT FOR
 1972                                                                          ;LINE 14
 1973  006700  052777  020000  006450          BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
 1974  006706  005067  171064                  CLR     PS                      ;ALLOW INTERRUPTS
 1975  006712  005300                  1$:     DEC     R0                      ;DELAY FOR NPR
 1976  006714  001376                          BNE     1$
 1977  006716  104001                          HLT     1                       ;NO INTERRUPT OCCURED, ERROR
 1978  006720  005777  006432          2$:     TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
 1979                                                                          ;DONE IS SET
 1980  006724  100401                          BMI     3$
 1981  006726  104002                          HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
 1982  006730  005777  006434          3$:     TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 14
 1983  006734  001404                          BEQ     4$
 1984  006736  005005                          CLR     R5                      ;(R5)=EXPECTED DATA IN
 1985                                                                          ;BUFFER ACTIVE REGISTER, 0
 1986  006740  017704  006424                  MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
 1987                                                                          ;BUFFER ACTIVE REGISTER
 1988  006744  104000                          HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
 1989  006746  022777  000001  006410  4$:     CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
```

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1990  006754  001405                          BEQ     5$
1991  006756  017704  006402                  MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
1992                                                                          ;OF BUS ADDRESS MEMORY FOR
1993                                                                          ;LINE 14
1994  006762  012705  000001                  MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
1995                                                                          ;BUS ADDRESS MEMORY FOR
1996                                                                          ;LINE 14, 1
1997  006766  104003                          HLT     3                       ;BUS ADDRESS NOT UPDATED
1998                                                                          ;CORRECTLY, ERROR
1999  006770  005777  006372          5$:     TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
2000  006774  001416                          BEQ     6$
2001  006776  017704  006364                  MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
2002                                                                          ;COUNT FOR LINE 14
2003  007002  005005                          CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
2004                                                                          ;COUNT FOR LINE 14, 0
2005  007004  104004                          HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
2006  007006  016777  006370  006364          MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
2007  007014  005077  006362                  CLR     @DHRLVL
2008  007020  016777  006362  006356          MOV     DHTLVL,@DHTVEC
2009  007026  005077  006354                  CLR     @DHTLVL
2010  007032  012706  017102          6$:     MOV     #STACK,SP               ;RESTORE STACK
2011  007036  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
2012
2013                                          ;NPR LOGIC TEST
2014                                          ;SET BYTE COUNT TO 1 FOR LINE 15
2015                                          ;SET BAR BIT FOR LINE 15
2016                                          ;DELAY FOR NPR
2017                                          ;VERIFY THAT BAR BIT FOR LINE 15 CLEARS
2018                                          ;VERIFY THAT TRANSMITTER DONE IS SET
2019
2020  007040  012767  000340  170730  T25:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2021  007046  012767  000020  006350          MOV     #20,ICOUNT              ;SET UP FOR 20 ITERATIONS
2022  007054  012767  007270  006336          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2023  007062  012777  004000  006266          MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
2024  007070  004767  006170                  JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
2025                                                                          ;AND BYTE COUNT MEMORY LOCATIONS
2026  007074  012777  007156  006302          MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
2027  007102  012777  000340  006276          MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
2028  007110  012777  000015  006240          MOV     #15,@DHSCR              ;SELECT LINE 15
2029  007116  012777  177777  006242          MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
2030  007124  012700  001000                  MOV     #1000,R0
2031  007130  012777  020000  006232          MOV     #20000,@DHBAR           ;SET BAR BIT FOR
2032                                                                          ;LINE 15
2033  007136  052777  020000  006212          BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
2034  007144  005067  170626                  CLR     PS                      ;ALLOW INTERRUPTS
2035  007150  005300                  1$:     DEC     R0                      ;DELAY FOR NPR
2036  007152  001376                          BNE     1$
2037  007154  104001                          HLT     1                       ;NO INTERRUPT OCCURED, ERROR
2038  007156  005777  006174          2$:     TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
2039                                                                          ;DONE IS SET
2040  007162  100401                          BMI     3$
2041  007164  104002                          HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
2042  007166  005777  006176          3$:     TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 15
2043  007172  001404                          BEQ     4$
2044  007174  005005                          CLR     R5                      ;(R5)=EXPECTED DATA IN
2045                                                                          ;BUFFER ACTIVE REGISTER, 0
```

```
2046  007176  017704  006166                    MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
2047                                                                              ;BUFFER ACTIVE REGISTER
2048  007202  104000                            HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
2049  007204  022777  000001  006152  4$:       CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
2050  007212  001405                            BEQ     5$
2051  007214  017704  006144                    MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
2052                                                                              ;OF BUS ADDRESS MEMORY FOR
2053                                                                              ;LINE 15
2054  007220  012705  000001                    MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
2055                                                                              ;BUS ADDRESS MEMORY FOR
2056                                                                              ;LINE 15, 1
2057  007224  104003                            HLT     3                       ;BUS ADDRESS NOT UPDATED
2058                                                                              ;CORRECTLY, ERROR
2059  007226  005777  006134          5$:       TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
2060  007232  001416                            BEQ     6$
2061  007234  017704  006126                    MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
2062                                                                              ;COUNT FOR LINE 15
2063  007240  005005                            CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
2064                                                                              ;COUNT FOR LINE 15, 0
2065  007242  104004                            HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
2066  007244  016777  006132  006126            MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
2067  007252  005077  006124                    CLR     @DHRLVL
2068  007256  016777  006124  006120            MOV     DHTLVL,@DHTVEC
2069  007264  005077  006116                    CLR     @DHTLVL
2070  007270  012706  017102          6$:       MOV     #STACK,SP               ;RESTORE STACK
2071  007274  104400                            SCOPE                           ;CHECK FOR ITERATIONS, LOOP
2072
2073                                            ;NPR LOGIC TEST
2074                                            ;SET BYTE COUNT TO 1 FOR LINE 16
2075                                            ;SET BAR BIT FOR LINE 16
2076                                            ;DELAY FOR NPR
2077                                            ;VERIFY THAT BAR BIT FOR LINE 16 CLEARS
2078                                            ;VERIFY THAT TRANSMITTER DONE IS SET
2079
2080  007276  012767  000340  170472  T26:       MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2081  007304  012767  000020  006112            MOV     #20,ICOUNT              ;SET UP FOR 20 ITERATIONS
2082  007312  012767  007526  006100            MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2083  007320  012777  004000  006030            MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
2084  007326  004767  005732                    JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
2085                                                                              ;AND BYTE COUNT MEMORY LOCATIONS
2086  007332  012777  007414  006044            MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
2087  007340  012777  000340  006040            MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
2088  007346  012777  000016  006002            MOV     #16,@DHSCR              ;SELECT LINE 16
2089  007354  012777  177777  006004            MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
2090  007362  012700  001000                    MOV     #1000,R0
2091  007366  012777  040000  005774            MOV     #40000,@DHBAR           ;SET BAR BIT FOR
2092                                                                              ;LINE 16
2093  007374  052777  020000  005754            BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
2094  007402  005067  170370                    CLR     PS                      ;ALLOW INTERRUPTS
2095  007406  005300                  1$:       DEC     R0                      ;DELAY FOR NPR
2096  007410  001376                            BNE     1$
2097  007412  104001                            HLT     1                       ;NO INTERRUPT OCCURED, ERROR
2098  007414  005777  005736          2$:       TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
2099                                                                              ;DONE IS SET
2100  007420  100401                            BMI     3$
2101  007422  104002                            HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
```

```
2102  007424  005777  005740          3$:     TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 16
2103  007430  001404                          BEQ     4$
2104  007432  005005                          CLR     R5                      ;(R5)=EXPECTED DATA IN
2105                                                                        ;BUFFER ACTIVE REGISTER, 0
2106  007434  017704  005730                  MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
2107                                                                        ;BUFFER ACTIVE REGISTER
2108  007440  104000                          HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
2109  007442  022777  000001  005714  4$:     CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
2110  007450  001405                          BEQ     5$
2111  007452  017704  005706                  MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
2112                                                                        ;OF BUS ADDRESS MEMORY FOR
2113                                                                        ;LINE 16
2114  007456  012705  000001                  MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
2115                                                                        ;BUS ADDRESS MEMORY FOR
2116                                                                        ;LINE 16, 1
2117  007462  104003                          HLT     3                       ;BUS ADDRESS NOT UPDATED
2118                                                                        ;CORRECTLY, ERROR
2119  007464  005777  005676          5$:     TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
2120  007470  001416                          BEQ     6$
2121  007472  017704  005670                  MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
2122                                                                        ;COUNT FOR LINE 16
2123  007476  005005                          CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
2124                                                                        ;COUNT FOR LINE 16, 0
2125  007500  104004                          HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
2126  007502  016777  005674  005670          MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
2127  007510  005077  005666                  CLR     @DHRLVL
2128  007514  016777  005666  005662          MOV     DHTLVL,@DHTVEC
2129  007522  005077  005660                  CLR     @DHTLVL
2130  007526  012706  017102          6$:     MOV     #STACK,SP               ;RESTORE STACK
2131  007532  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
2132
2133                                          ;NPR LOGIC TEST
2134                                          ;SET BYTE COUNT TO 1 FOR LINE 17
2135                                          ;SET BAR BIT FOR LINE 17
2136                                          ;DELAY FOR NPR
2137                                          ;VERIFY THAT BAR BIT FOR LINE 17 CLEARS
2138                                          ;VERIFY THAT TRANSMITTER DONE IS SET
2139
2140  007534  012767  000340  170234  T27:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2141  007542  012767  000020  005654          MOV     #20,ICOUNT              ;SET UP FOR 20 ITERATIONS
2142  007550  012767  007764  005642          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2143  007556  012777  004000  005572          MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
2144  007564  004767  005474                  JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
2145                                                                        ;AND BYTE COUNT MEMORY LOCATIONS
2146  007570  012777  007652  005606          MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
2147  007576  012777  000340  005602          MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
2148  007604  012777  000017  005544          MOV     #17,@DHSCR              ;SELECT LINE 17
2149  007612  012777  177777  005546          MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
2150  007620  012700  001000                  MOV     #1000,R0
2151  007624  012777  100000  005536          MOV     #100000,@DHBAR          ;SET BAR BIT FOR
2152                                                                        ;LINE 17
2153  007632  052777  020000  005516          BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
2154  007640  005067  170132                  CLR     PS                      ;ALLOW INTERRUPTS
2155  007644  005300                  1$:     DEC     R0                      ;DELAY FOR NPR
2156  007646  001376                          BNE     1$
2157  007650  104001                          HLT     1                       ;NO INTERRUPT OCCURED, ERROR
```

```
2158  007652  005777  005500          2$:     TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
2159                                                                          ;DONE IS SET
2160  007656  100401                          BMI     3$
2161  007660  104002                          HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
2162  007662  005777  005502          3$:     TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 17
2163  007666  001404                          BEQ     4$
2164  007670  005005                          CLR     R5                      ;(R5)=EXPECTED DATA IN
2165                                                                          ;BUFFER ACTIVE REGISTER, 0
2166  007672  017704  005472                  MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
2167                                                                          ;BUFFER ACTIVE REGISTER
2168  007676  104000                          HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
2169  007700  022777  000001  005456  4$:     CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
2170  007706  001405                          BEQ     5$
2171  007710  017704  005450                  MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
2172                                                                          ;OF BUS ADDRESS MEMORY FOR
2173                                                                          ;LINE 17
2174  007714  012705  000001                  MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
2175                                                                          ;BUS ADDRESS MEMORY FOR
2176                                                                          ;LINE 17, 1
2177  007720  104003                          HLT     3                       ;BUS ADDRESS NOT UPDATED
2178                                                                          ;CORRECTLY, ERROR
2179  007722  005777  005440          5$:     TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
2180  007726  001416                          BEQ     6$
2181  007730  017704  005432                  MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
2182                                                                          ;COUNT FOR LINE 17
2183  007734  005005                          CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
2184                                                                          ;COUNT FOR LINE 17, 0
2185  007736  104004                          HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
2186  007740  016777  005436  005432          MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
2187  007746  005077  005430                  CLR     @DHRLVL
2188  007752  016777  005430  005424          MOV     DHTLVL,@DHTVEC
2189  007760  005077  005422                  CLR     @DHTLVL
2190  007764  012706  017102          6$:     MOV     #STACK,SP               ;RESTORE STACK
2191  007770  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
2192
2193                                          ;NPR LOGIC TEST
2194                                          ;SET BYTE COUNT ON ALL LINES TO 1
2195                                          ;SET BAR BIT FOR LINE 0
2196                                          ;VERIFY THAT BYTE COUNT FOR LINE 0 GOES TO 0
2197                                          ;VERIFY THAT BUS ADDRESS FOR LINE 0 IS INCREMENTED
2198                                          ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
2199                                          ;ARE UNCHANGED
2200
2201  007772  012767  000340  167776  T30:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2202  010000  012767  000010  005416          MOV     #10,ICOUNT              ;SET UP FOR 10 ITERATIONS
2203  010006  012767  010140  005404          MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2204  010014  012777  004000  005334          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2205                                                                          ;TO SET ALL TBMT BITS
2206  010022  004767  005236                  JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
2207                                                                          ;BUS ADDRESS MEMORY LOCATIONS
2208  010026  004767  005264                  JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
2209  010032  012777  000001  005330          MOV     #1,@DHBAR               ;SET BAR BIT FOR LINE 0
2210  010040  005777  005312          3$:     TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
2211  010044  100375                          BPL     3$
2212  010046  012700  000020                  MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
2213  010052  005077  005300                  CLR     @DHSCR                  ;START AT LINE 0
```

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2214  010056  005001                        CLR     R1                      ;KEEP TRACK OF LINE NUMBER
2215  010060  012705  177777          4$:   MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
2216                                                                        ;IF LINE NUMBER NOT = 0
2217  010064  005003                        CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
2218                                                                        ;IF LINE NUMBER NOT = 0
2219  010066  017704  005274                MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
2220  010072  017702  005266                MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
2221  010076  027727  005254  000000        CMP     @DHSCR,#0       ;IF LINE BEING COMPARED IS LINE 0
2222  010104  001002                        BNE     5$
2223  010106  005005                        CLR     R5                      ;EXPECTED BYTE COUNT=0
2224  010110  005203                        INC     R3                      ;EXPECTED BUS ADDRESS = 1
2225  010112  020504                  5$:   CMP     R5,R4                   ;IS BYTE COUNT CORRECT
2226  010114  001401                        BEQ     6$
2227  010116  104004                        HLT     4                       ;BYTE COUNT ERROR
2228  010120  020302                  6$:   CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
2229  010122  001401                        BEQ     7$
2230  010124  104003                        HLT     3                       ;BUS ADDRESS ERROR
2231  010126  005277  005224          7$:   INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
2232  010132  005201                        INC     R1
2233  010134  005300                        DEC     R0                      ;CONTINUE IF ALL NOT DONE
2234  010136  001350                        BNE     4$
2235  010140  104400                  8$:   SCOPE                           ;CHECK FOR ITERATIONS, LOOP
2236
2237                                        ;NPR LOGIC TEST
2238                                        ;SET BYTE COUNT ON ALL LINES TO 1
2239                                        ;SET BAR BIT FOR LINE 1
2240                                        ;VERIFY THAT BYTE COUNT FOR LINE 1 GOES TO 0
2241                                        ;VERIFY THAT BUS ADDRESS FOR LINE 1 IS INCREMENTED
2242                                        ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
2243                                        ;ARE UNCHANGED
2244
2245  010142  012767  000340  167626  T31:  MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2246  010150  012767  000010  005246        MOV     #10,ICOUNT              ;SET UP FOR 10 ITERATIONS
2247  010156  012767  010310  005234        MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2248  010164  012777  004000  005164        MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2249                                                                        ;TO SET ALL TBMT BITS
2250  010172  004767  005066                JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
2251                                                                        ;BUS ADDRESS MEMORY LOCATIONS
2252  010176  004767  005114                JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
2253  010202  012777  000002  005160        MOV     #2,@DHBAR               ;SET BAR BIT FOR LINE 1
2254  010210  005777  005142          3$:   TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
2255  010214  100375                        BPL     3$
2256  010216  012700  000020                MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
2257  010222  005077  005130                CLR     @DHSCR                  ;START AT LINE 0
2258  010226  005001                        CLR     R1                      ;KEEP TRACK OF LINE NUMBER
2259  010230  012705  177777          4$:   MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
2260                                                                        ;IF LINE NUMBER NOT = 1
2261  010234  005003                        CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
2262                                                                        ;IF LINE NUMBER NOT = 1
2263  010236  017704  005124                MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
2264  010242  017702  005116                MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
2265  010246  027727  005104  000001        CMP     @DHSCR,#1       ;IF LINE BEING COMPARED IS LINE 1
2266  010254  001002                        BNE     5$
2267  010256  005005                        CLR     R5                      ;EXPECTED BYTE COUNT=0
2268  010260  005203                        INC     R3                      ;EXPECTED BUS ADDRESS = 1
2269  010262  020504                  5$:   CMP     R5,R4                   ;IS BYTE COUNT CORRECT
```

```
2270  010264  001401                        BEQ     6$
2271  010266  104004                        HLT     4                       ;BYTE COUNT ERROR
2272  010270  020302              6$:       CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
2273  010272  001401                        BEQ     7$
2274  010274  104003                        HLT     3                       ;BUS ADDRESS ERROR
2275  010276  005277  005054      7$:       INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
2276  010302  005201                        INC     R1
2277  010304  005300                        DEC     R0                      ;CONTINUE IF ALL NOT DONE
2278  010306  001350                        BNE     4$
2279  010310  104400              8$:       SCOPE                           ;CHECK FOR ITERATIONS, LOOP
2280
2281                                        ;NPR LOGIC TEST
2282                                        ;SET BYTE COUNT ON ALL LINES TO 1
2283                                        ;SET BAR BIT FOR LINE 2
2284                                        ;VERIFY THAT BYTE COUNT FOR LINE 2 GOES TO 0
2285                                        ;VERIFY THAT BUS ADDRESS FOR LINE 2 IS INCREMENTED
2286                                        ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
2287                                        ;ARE UNCHANGED
2288
2289  010312  012767  000340  167456  T32:  MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2290  010320  012767  000010  005076        MOV     #10,ICOUNT              ;SET UP FOR 10 ITERATIONS
2291  010326  012767  010460  005064        MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2292  010334  012777  004000  005014        MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2293                                                                        ;TO SET ALL TBMT BITS
2294  010342  004767  004716                JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
2295                                                                        ;BUS ADDRESS MEMORY LOCATIONS
2296  010346  004767  004744                JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
2297  010352  012777  000004  005010        MOV     #4,@DHBAR               ;SET BAR BIT FOR LINE 2
2298  010360  005777  004772      3$:       TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
2299  010364  100375                        BPL     3$
2300  010366  012700  000020                MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
2301  010372  005077  004760                CLR     @DHSCR                  ;START AT LINE 0
2302  010376  005001                        CLR     R1                      ;KEEP TRACK OF LINE NUMBER
2303  010400  012705  177777      4$:       MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
2304                                                                        ;IF LINE NUMBER NOT = 2
2305  010404  005003                        CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
2306                                                                        ;IF LINE NUMBER NOT = 2
2307  010406  017704  004754                MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
2308  010412  017702  004746                MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
2309  010416  027727  004734  000002        CMP     @DHSCR,#2       ;IF LINE BEING COMPARED IS LINE 2
2310  010424  001002                        BNE     5$
2311  010426  005005                        CLR     R5                      ;EXPECTED BYTE COUNT=0
2312  010430  005203                        INC     R3                      ;EXPECTED BUS ADDRESS = 1
2313  010432  020504              5$:       CMP     R5,R4                   ;IS BYTE COUNT CORRECT
2314  010434  001401                        BEQ     6$
2315  010436  104004                        HLT     4                       ;BYTE COUNT ERROR
2316  010440  020302              6$:       CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
2317  010442  001401                        BEQ     7$
2318  010444  104003                        HLT     3                       ;BUS ADDRESS ERROR
2319  010446  005277  004704      7$:       INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
2320  010452  005201                        INC     R1
2321  010454  005300                        DEC     R0                      ;CONTINUE IF ALL NOT DONE
2322  010456  001350                        BNE     4$
2323  010460  104400              8$:       SCOPE                           ;CHECK FOR ITERATIONS, LOOP
2324
2325                                        ;NPR LOGIC TEST
```

```
2326                                            ;SET BYTE COUNT ON ALL LINES TO 1
2327                                            ;SET BAR BIT FOR LINE 3
2328                                            ;VERIFY THAT BYTE COUNT FOR LINE 3 GOES TO 0
2329                                            ;VERIFY THAT BUS ADDRESS FOR LINE 3 IS INCREMENTED
2330                                            ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
2331                                            ;ARE UNCHANGED
2332
2333  010462  012767  000340  167306  T33:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2334  010470  012767  000010  004726          MOV     #10,ICOUNT              ;SET UP FOR 10 ITERATIONS
2335  010476  012767  010630  004714          MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2336  010504  012777  004000  004644          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2337                                                                          ;TO SET ALL TBMT BITS
2338  010512  004767  004546                  JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
2339                                                                          ;BUS ADDRESS MEMORY LOCATIONS
2340  010516  004767  004574                  JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
2341  010522  012777  000010  004640          MOV     #10,@DHBAR              ;SET BAR BIT FOR LINE 3
2342  010530  005777  004622          3$:     TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
2343  010534  100375                          BPL     3$
2344  010536  012700  000020                  MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
2345  010542  005077  004610                  CLR     @DHSCR                  ;START AT LINE 0
2346  010546  005001                          CLR     R1                      ;KEEP TRACK OF LINE NUMBER
2347  010550  012705  177777          4$:     MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
2348                                                                          ;IF LINE NUMBER NOT = 3
2349  010554  005003                          CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
2350                                                                          ;IF LINE NUMBER NOT = 3
2351  010556  017704  004604                  MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
2352  010562  017702  004576                  MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
2353  010566  027727  004564  000003          CMP     @DHSCR,#3       ;IF LINE BEING COMPARED IS LINE 3
2354  010574  001002                          BNE     5$
2355  010576  005005                          CLR     R5                      ;EXPECTED BYTE COUNT=0
2356  010600  005203                          INC     R3                      ;EXPECTED BUS ADDRESS = 1
2357  010602  020504          5$:     CMP     R5,R4                   ;IS BYTE COUNT CORRECT
2358  010604  001401                          BEQ     6$
2359  010606  104004                          HLT     4                       ;BYTE COUNT ERROR
2360  010610  020302          6$:     CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
2361  010612  001401                          BEQ     7$
2362  010614  104003                          HLT     3                       ;BUS ADDRESS ERROR
2363  010616  005277  004534          7$:     INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
2364  010622  005201                          INC     R1
2365  010624  005300                          DEC     R0                      ;CONTINUE IF ALL NOT DONE
2366  010626  001350                          BNE     4$
2367  010630  104400          8$:     SCOPE                                   ;CHECK FOR ITERATIONS, LOOP
2368
2369                                            ;NPR LOGIC TEST
2370                                            ;SET BYTE COUNT ON ALL LINES TO 1
2371                                            ;SET BAR BIT FOR LINE 4
2372                                            ;VERIFY THAT BYTE COUNT FOR LINE 4 GOES TO 0
2373                                            ;VERIFY THAT BUS ADDRESS FOR LINE 4 IS INCREMENTED
2374                                            ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
2375                                            ;ARE UNCHANGED
2376
2377  010632  012767  000340  167136  T34:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2378  010640  012767  000010  004556          MOV     #10,ICOUNT              ;SET UP FOR 10 ITERATIONS
2379  010646  012767  011000  004544          MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2380  010654  012777  004000  004474          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2381                                                                          ;TO SET ALL TBMT BITS
```

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2382  010662  004767  004376                JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
2383                                                                          ;BUS ADDRESS MEMORY LOCATIONS
2384  010666  004767  004424                JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
2385  010672  012777  000020  004470        MOV     #20,@DHBAR              ;SET BAR BIT FOR LINE 4
2386  010700  005777  004452          3$:   TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
2387  010704  100375                        BPL     3$
2388  010706  012700  000020                MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
2389  010712  005077  004440                CLR     @DHSCR                  ;START AT LINE 0
2390  010716  005001                        CLR     R1                      ;KEEP TRACK OF LINE NUMBER
2391  010720  012705  177777          4$:   MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
2392                                                                          ;IF LINE NUMBER NOT = 4
2393  010724  005003                        CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
2394                                                                          ;IF LINE NUMBER NOT = 4
2395  010726  017704  004434                MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
2396  010732  017702  004426                MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
2397  010736  027727  004414  000004        CMP     @DHSCR,#4       ;IF LINE BEING COMPARED IS LINE 4
2398  010744  001002                        BNE     5$
2399  010746  005005                        CLR     R5                      ;EXPECTED BYTE COUNT=0
2400  010750  005203                        INC     R3                      ;EXPECTED BUS ADDRESS = 1
2401  010752  020504          5$:   CMP     R5,R4                   ;IS BYTE COUNT CORRECT
2402  010754  001401                        BEQ     6$
2403  010756  104004                        HLT     4                       ;BYTE COUNT ERROR
2404  010760  020302          6$:   CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
2405  010762  001401                        BEQ     7$
2406  010764  104003                        HLT     3                       ;BUS ADDRESS ERROR
2407  010766  005277  004364          7$:   INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
2408  010772  005201                        INC     R1
2409  010774  005300                        DEC     R0                      ;CONTINUE IF ALL NOT DONE
2410  010776  001350                        BNE     4$
2411  011000  104400          8$:   SCOPE                                   ;CHECK FOR ITERATIONS, LOOP
2412
2413                                        ;NPR LOGIC TEST
2414                                        ;SET BYTE COUNT ON ALL LINES TO 1
2415                                        ;SET BAR BIT FOR LINE 5
2416                                        ;VERIFY THAT BYTE COUNT FOR LINE 5 GOES TO 0
2417                                        ;VERIFY THAT BUS ADDRESS FOR LINE 5 IS INCREMENTED
2418                                        ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
2419                                        ;ARE UNCHANGED
2420
2421  011002  012767  000340  166766  T35:   MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2422  011010  012767  000010  004406        MOV     #10.,ICOUNT             ;SET UP FOR 10 ITERATIONS
2423  011016  012767  011150  004374        MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2424  011024  012777  004000  004324        MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2425                                                                          ;TO SET ALL TBMT BITS
2426  011032  004767  004226                JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
2427                                                                          ;BUS ADDRESS MEMORY LOCATIONS
2428  011036  004767  004254                JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
2429  011042  012777  000040  004320        MOV     #40,@DHBAR              ;SET BAR BIT FOR LINE 5
2430  011050  005777  004302          3$:   TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
2431  011054  100375                        BPL     3$
2432  011056  012700  000020                MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
2433  011062  005077  004270                CLR     @DHSCR                  ;START AT LINE 0
2434  011066  005001                        CLR     R1                      ;KEEP TRACK OF LINE NUMBER
2435  011070  012705  177777          4$:   MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
2436                                                                          ;IF LINE NUMBER NOT = 5
2437  011074  005003                        CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
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2438
2439  011076  017704  004264                  MOV     @DHBC,R4                ;IF LINE NUMBER NOT = 5
2440  011102  017702  004256                  MOV     @DHBA,R2                ;(R4)=ACTUAL BYTE ACOUNT
2441  011106  027727  004244  000005          CMP     @DHSCR,#5       ;IF LINE BEING COMPARED IS LINE 5
2442  011114  001002                          BNE     5$
2443  011116  005005                          CLR     R5                      ;EXPECTED BYTE COUNT=0
2444  011120  005203                          INC     R3                      ;EXPECTED BUS ADDRESS = 1
2445  011122  020504                  5$:     CMP     R5,R4                   ;IS BYTE COUNT CORRECT
2446  011124  001401                          BEQ     6$
2447  011126  104004                          HLT     4                       ;BYTE COUNT ERROR
2448  011130  020302                  6$:     CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
2449  011132  001401                          BEQ     7$
2450  011134  104003                          HLT     3                       ;BUS ADDRESS ERROR
2451  011136  005277  004214          7$:     INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
2452  011142  005201                          INC     R1
2453  011144  005300                          DEC     R0                      ;CONTINUE IF ALL NOT DONE
2454  011146  001350                          BNE     4$
2455  011150  104400                  8$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
2456
2457                                          ;NPR LOGIC TEST
2458                                          ;SET BYTE COUNT ON ALL LINES TO 1
2459                                          ;SET BAR BIT FOR LINE 6
2460                                          ;VERIFY THAT BYTE COUNT FOR LINE 6 GOES TO 0
2461                                          ;VERIFY THAT BUS ADDRESS FOR LINE 6 IS INCREMENTED
2462                                          ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
2463                                          ;ARE UNCHANGED
2464
2465  011152  012767  000340  166616  T36:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2466  011160  012767  000010  00423E          MOV     #10,ICOUNT              ;SET UP FOR 10 ITERATIONS
2467  011166  012767  011320  004224          MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2468  011174  012777  004000  004154          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2469                                                                          ;TO SET ALL TBMT BITS
2470  011202  004767  004056                  JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
2471                                                                          ;BUS ADDRESS MEMORY LOCATIONS
2472  011206  004767  004104                  JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
2473  011212  012777  000100  004150          MOV     #100,@DHBAR             ;SET BAR BIT FOR LINE 6
2474  011220  005777  004132          3$:     TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
2475  011224  100375                          BPL     3$
2476  011226  012700  000020                  MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
2477  011232  005077  004120                  CLR     @DHSCR                  ;START AT LINE 0
2478  011236  005001                          CLR     R1                      ;KEEP TRACK OF LINE NUMBER
2479  011240  012705  177777          4$:     MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
2480                                                                          ;IF LINE NUMBER NOT = 6
2481  011244  005003                          CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
2482                                                                          ;IF LINE NUMBER NOT = 6
2483  011246  017704  004114                  MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
2484  011252  017702  004106                  MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
2485  011256  027727  004074  000006          CMP     @DHSCR,#6       ;IF LINE BEING COMPARED IS LINE 6
2486  011264  001002                          BNE     5$
2487  011266  005005                          CLR     R5                      ;EXPECTED BYTE COUNT=0
2488  011270  005203                          INC     R3                      ;EXPECTED BUS ADDRESS = 1
2489  011272  020504                  5$:     CMP     R5,R4                   ;IS BYTE COUNT CORRECT
2490  011274  001401                          BEQ     6$
2491  011276  104004                          HLT     4                       ;BYTE COUNT ERROR
2492  011300  020302                  6$:     CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
2493  011302  001401                          BEQ     7$
```

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2494  011304  104003                    HLT     3                       ;BUS ADDRESS ERROR
2495  011306  005277  004044    7$:     INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
2496  011312  005201                    INC     R1
2497  011314  005300                    DEC     R0                      ;CONTINUE IF ALL NOT DONE
2498  011316  001350                    BNE     4$
2499  011320  104400            8$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
2500
2501                                    ;NPR LOGIC TEST
2502                                    ;SET BYTE COUNT ON ALL LINES TO 1
2503                                    ;SET BAR BIT FOR LINE 7
2504                                    ;VERIFY THAT BYTE COUNT FOR LINE 7 GOES TO 0
2505                                    ;VERIFY THAT BUS ADDRESS FOR LINE 7 IS INCREMENTED
2506                                    ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
2507                                    ;ARE UNCHANGED
2508
2509  011322  012767  000340  166446  T37:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2510  011330  012767  000010  004066          MOV     #10,ICOUNT              ;SET UP FOR 10 ITERATIONS
2511  011336  012767  011470  004054          MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2512  011344  012777  004000  004004          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2513                                                                          ;TO SET ALL TBMT BITS
2514  011352  004767  003706                  JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
2515                                                                          ;BUS ADDRESS MEMORY LOCATIONS
2516  011356  004767  003734                  JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
2517  011362  012777  000200  004000          MOV     #200,@DHBAR             ;SET BAR BIT FOR LINE 7
2518  011370  005777  003762            3$:   TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
2519  011374  100375                    BPL     3$
2520  011376  012700  000020                  MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
2521  011402  005077  003750                  CLR     @DHSCR                  ;START AT LINE 0
2522  011406  005001                    CLR     R1                      ;KEEP TRACK OF LINE NUMBER
2523  011410  012705  177777    4$:     MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
2524                                                                          ;IF LINE NUMBER NOT = 7
2525  011414  005003                    CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
2526                                                                          ;IF LINE NUMBER NOT = 7
2527  011416  017704  003744                  MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
2528  011422  017702  003736                  MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
2529  011426  027727  003724  000007          CMP     @DHSCR,#7       ;IF LINE BEING COMPARED IS LINE 7
2530  011434  001002                    BNE     5$
2531  011436  005005                    CLR     R5                      ;EXPECTED BYTE COUNT=0
2532  011440  005203                    INC     R3                      ;EXPECTED BUS ADDRESS = 1
2533  011442  020504            5$:     CMP     R5,R4                   ;IS BYTE COUNT CORRECT
2534  011444  001401                    BEQ     6$
2535  011446  104004                    HLT     4                       ;BYTE COUNT ERROR
2536  011450  020302            6$:     CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
2537  011452  001401                    BEQ     7$
2538  011454  104003                    HLT     3                       ;BUS ADDRESS ERROR
2539  011456  005277  003674    7$:     INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
2540  011462  005201                    INC     R1
2541  011464  005300                    DEC     R0                      ;CONTINUE IF ALL NOT DONE
2542  011466  001350                    BNE     4$
2543  011470  104400            8$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
2544
2545                                    ;NPR LOGIC TEST
2546                                    ;SET BYTE COUNT ON ALL LINES TO 1
2547                                    ;SET BAR BIT FOR LINE 10
2548                                    ;VERIFY THAT BYTE COUNT FOR LINE 10 GOES TO 0
2549                                    ;VERIFY THAT BUS ADDRESS FOR LINE 10 IS INCREMENTED
```

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2550                                            ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
2551                                            ;ARE UNCHANGED
2552
2553  011472  012767  000340  166276  T40:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2554  011500  012767  000010  003716          MOV     #10,ICOUNT              ;SET UP FOR 10 ITERATIONS
2555  011506  012767  011640  003704          MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2556  011514  012777  004000  003634          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2557                                                                          ;TO SET ALL TBMT BITS
2558  011522  004767  003536                  JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
2559                                                                          ;BUS ADDRESS MEMORY LOCATIONS
2560  011526  004767  003564                  JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
2561  011532  012777  000400  003630          MOV     #400,@DHBAR             ;SET BAR BIT FOR LINE 10
2562  011540  005777  003612          3$:     TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
2563  011544  100375                          BPL     3$
2564  011546  012700  000020                  MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
2565  011552  005077  003600                  CLR     @DHSCR                  ;START AT LINE 0
2566  011556  005001                          CLR     R1                      ;KEEP TRACK OF LINE NUMBER
2567  011560  012705  177777          4$:     MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
2568                                                                          ;IF LINE NUMBER NOT = 10
2569  011564  005003                          CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
2570                                                                          ;IF LINE NUMBER NOT = 10
2571  011566  017704  003574                  MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
2572  011572  017702  003566                  MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
2573  011576  027727  003554  000010          CMP     @DHSCR,#10      ;IF LINE BEING COMPARED IS LINE 10
2574  011604  001002                          BNE     5$
2575  011606  005005                          CLR     R5                      ;EXPECTED BYTE COUNT=0
2576  011610  005203                          INC     R3                      ;EXPECTED BUS ADDRESS = 1
2577  011612  020504          5$:     CMP     R5,R4                   ;IS BYTE COUNT CORRECT
2578  011614  001401                          BEQ     6$
2579  011616  104004                          HLT     4                       ;BYTE COUNT ERROR
2580  011620  020302          6$:     CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
2581  011622  001401                          BEQ     7$
2582  011624  104003                          HLT     3                       ;BUS ADDRESS ERROR
2583  011626  005277  003524          7$:     INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
2584  011632  005201                          INC     R1
2585  011634  005300                          DEC     R0                      ;CONTINUE IF ALL NOT DONE
2586  011636  001350                          BNE     4$
2587  011640  104400          8$:     SCOPE                                   ;CHECK FOR ITERATIONS, LOOP
2588
2589                                            ;NPR LOGIC TEST
2590                                            ;SET BYTE COUNT ON ALL LINES TO 1
2591                                            ;SET BAR BIT FOR LINE 11
2592                                            ;VERIFY THAT BYTE COUNT FOR LINE 11 GOES TO 0
2593                                            ;VERIFY THAT BUS ADDRESS FOR LINE 11 IS INCREMENTED
2594                                            ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
2595                                            ;ARE UNCHANGED
2596
2597  011642  012767  000340  166126  T41:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2598  011650  012767  000010  003546          MOV     #10,ICOUNT              ;SET UP FOR 10 ITERATIONS
2599  011656  012767  012010  003534          MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2600  011664  012777  004000  003464          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2601                                                                          ;TO SET ALL TBMT BITS
2602  011672  004767  003366                  JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
2603                                                                          ;BUS ADDRESS MEMORY LOCATIONS
2604  011676  004767  003414                  JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
2605  011702  012777  001000  003460          MOV     #1000,@DHBAR            ;SET BAR BIT FOR LINE 11
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2606  011710  005777  003442          3$:     TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
2607  011714  100375                          BPL     3$
2608  011716  012700  000020                  MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
2609  011722  005077  003430                  CLR     @DHSCR                  ;START AT LINE 0
2610  011726  005001                          CLR     R1                      ;KEEP TRACK OF LINE NUMBER
2611  011730  012705  177777          4$:     MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
2612                                                                          ;IF LINE NUMBER NOT = 11
2613  011734  005003                          CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
2614                                                                          ;IF LINE NUMBER NOT = 11
2615  011736  017704  003424                  MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
2616  011742  017702  003416                  MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
2617  011746  027727  003404  000011          CMP     @DHSCR,#11      ;IF LINE BEING COMPARED IS LINE 11
2618  011754  001002                          BNE     5$
2619  011756  005005                          CLR     R5                      ;EXPECTED BYTE COUNT=0
2620  011760  005203                          INC     R3                      ;EXPECTED BUS ADDRESS = 1
2621  011762  020504          5$:     CMP     R5,R4                   ;IS BYTE COUNT CORRECT
2622  011764  001401                          BEQ     6$
2623  011766  104004                          HLT     4                       ;BYTE COUNT ERROR
2624  011770  020302          6$:     CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
2625  011772  001401                          BEQ     7$
2626  011774  104003                          HLT     3                       ;BUS ADDRESS ERROR
2627  011776  005277  003354          7$:     INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
2628  012002  005201                          INC     R1
2629  012004  005300                          DEC     R0                      ;CONTINUE IF ALL NOT DONE
2630  012006  001350                          BNE     4$
2631  012010  104400          8$:     SCOPE                                   ;CHECK FOR ITERATIONS, LOOP
2632
2633                                  ;NPR LOGIC TEST
2634                                  ;SET BYTE COUNT ON ALL LINES TO 1
2635                                  ;SET BAR BIT FOR LINE 12
2636                                  ;VERIFY THAT BYTE COUNT FOR LINE 12 GOES TO 0
2637                                  ;VERIFY THAT BUS ADDRESS FOR LINE 12 IS INCREMENTED
2638                                  ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
2639                                  ;ARE UNCHANGED
2640
2641  012012  012767  000340  165756  T42:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2642  012020  012767  000010  003376          MOV     #10,ICOUNT              ;SET UP FOR 10 ITERATIONS
2643  012026  012767  012160  003364          MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2644  012034  012777  004000  003314          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2645                                                                          ;TO SET ALL TBMT BITS
2646  012042  004767  003216                  JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
2647                                                                          ;BUS ADDRESS MEMORY LOCATIONS
2648  012046  004767  003244                  JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
2649  012052  012777  002000  003310          MOV     #2000,@DHBAR            ;SET BAR BIT FOR LINE 12
2650  012060  005777  003272          3$:     TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
2651  012064  100375                          BPL     3$
2652  012066  012700  000020                  MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
2653  012072  005077  003260                  CLR     @DHSCR                  ;START AT LINE 0
2654  012076  005001                          CLR     R1                      ;KEEP TRACK OF LINE NUMBER
2655  012100  012705  177777          4$:     MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
2656                                                                          ;IF LINE NUMBER NOT = 12
2657  012104  005003                          CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
2658                                                                          ;IF LINE NUMBER NOT = 12
2659  012106  017704  003254                  MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
2660  012112  017702  003246                  MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
2661  012116  027727  003234  000012          CMP     @DHSCR,#12      ;IF LINE BEING COMPARED IS LINE 12
```

```
                                        BNE     5$                              
                                        CLR     R5                              ;EXPECTED BYTE COUNT=0
                                        INC     R3                              ;EXPECTED BUS ADDRESS = 1
                                5$:     CMP     R5,R4                           ;IS BYTE COUNT CORRECT
                                        BEQ     6$                              
                                        HLT     4                               ;BYTE COUNT ERROR
                                6$:     CMP     R3,R2                           ;IS BUS ADDRESS CORRECT
                                        BEQ     7$                              
                                        HLT     3                               ;BUS ADDRESS ERROR
                        003204  7$:     INC     @DHSCR                          ;PREPARE TO CHECK NEXT LINE
                                        INC     R1                              
                                        DEC     R0                              ;CONTINUE IF ALL NOT DONE
                                        BNE     4$                              
                                8$:     SCOPE                                   ;CHECK FOR ITERATIONS, LOOP

                                        ;NPR LOGIC TEST
                                        ;SET BYTE COUNT ON ALL LINES TO 1
                                        ;SET BAR BIT FOR LINE 13
                                        ;VERIFY THAT BYTE COUNT FOR LINE 13 GOES TO 0
                                        ;VERIFY THAT BUS ADDRESS FOR LINE 13 IS INCREMENTED
                                        ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
                                        ;ARE UNCHANGED

012162  012767  000340  165606  T43:   MOV     #340,PS                         ;DISABLE ALL INTERRUPTS
012170  012767  000010  003226        MOV     #10,ICOUNT                      ;SET UP FOR 10 ITERATIONS
012176  012767  012330  003214        MOV     #8$,ESCAPE                      ;SET UP TO ESCAPE TO NEXT TEST
012204  012777  004000  003144        MOV     #BIT11,@DHSCR                   ;MASTER CLEAR INTERFACE
                                                                                ;TO SET ALL TBMT BITS
012212  004767  003046                JSR     PC,CLEAR                        ;CLEAR ALL BYTE COUNT AND
                                                                                ;BUS ADDRESS MEMORY LOCATIONS
012216  004767  003074                JSR     PC,LOAD                         ;SET ALL BYTE COUNT LOCATIONS TO -1
012222  012777  004000  003140        MOV     #4000,@DHBAR                    ;SET BAR BIT FOR LINE 13
012230  005777  003122          3$:   TST     @DHSCR                          ;WAIT FOR TRANSMITTER DONE
012234  100375                        BPL     3$                              
012236  012700  000020                MOV     #20,R0                          ;SET UP TO CHECK ALL 16 LINES
012242  005077  003110                CLR     @DHSCR                          ;START AT LINE 0
012246  005001                        CLR     R1                              ;KEEP TRACK OF LINE NUMBER
012250  012705  177777          4$:   MOV     #-1,R5                          ;(R5)=EXPECTED BYTE COUNT,
                                                                                ;IF LINE NUMBER NOT = 13
012254  005003                        CLR     R3                              ;(R3)=EXPECTED BUS ADDRESS,
                                                                                ;IF LINE NUMBER NOT = 13
012256  017704  003104                MOV     @DHBC,R4                        ;(R4)=ACTUAL BYTE ACOUNT
012262  017702  003076                MOV     @DHBA,R2                        ;(R5)=ACTUAL BUS ADDRESS
012266  027727  003064  000013        CMP     @DHSCR,#13      ;IF LINE BEING COMPARED IS LINE 13
012274  001002                        BNE     5$                              
012276  005005                        CLR     R5                              ;EXPECTED BYTE COUNT=0
012300  005203                        INC     R3                              ;EXPECTED BUS ADDRESS = 1
012302  020504                  5$:   CMP     R5,R4                           ;IS BYTE COUNT CORRECT
012304  001401                        BEQ     6$                              
012306  104004                        HLT     4                               ;BYTE COUNT ERROR
012310  020302                  6$:   CMP     R3,R2                           ;IS BUS ADDRESS CORRECT
012312  001401                        BEQ     7$                              
012314  104003                        HLT     3                               ;BUS ADDRESS ERROR
012316  005277  003034          7$:   INC     @DHSCR                          ;PREPARE TO CHECK NEXT LINE
012322  005201                        INC     R1                              
012324  005300                        DEC     R0                              ;CONTINUE IF ALL NOT DONE
```

```
2718  012326  001350                        BNE     4$
2719  012330  104400              8$:       SCOPE                           ;CHECK FOR ITERATIONS, LOOP
2720
2721                                        ;NPR LOGIC TEST
2722                                        ;SET BYTE COUNT ON ALL LINES TO 1
2723                                        ;SET BAR BIT FOR LINE 14
2724                                        ;VERIFY THAT BYTE COUNT FOR LINE 14 GOES TO 0
2725                                        ;VERIFY THAT BUS ADDRESS FOR LINE 14 IS INCREMENTED
2726                                        ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
2727                                        ;ARE UNCHANGED
2728
2729  012332  012767  000340  165436  T44:  MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2730  012340  012767  000010  003056        MOV     #10.,ICOUNT             ;SET UP FOR 10 ITERATIONS
2731  012346  012767  012500  003044        MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2732  012354  012777  004000  002774        MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2733                                                                        ;TO SET ALL TBMT BITS
2734  012362  004767  002676                JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
2735                                                                        ;BUS ADDRESS MEMORY LOCATIONS
2736  012366  004767  002724                JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
2737  012372  012777  010000  002770        MOV     #10000,@DHBAR           ;SET BAR BIT FOR LINE 14
2738  012400  005777  002752          3$:   TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
2739  012404  100375                        BPL     3$
2740  012406  012700  000020                MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
2741  012412  005077  002740                CLR     @DHSCR                  ;START AT LINE 0
2742  012416  005001                        CLR     R1                      ;KEEP TRACK OF LINE NUMBER
2743  012420  012705  177777          4$:   MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
2744                                                                        ;IF LINE NUMBER NOT = 14
2745  012424  005003                        CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
2746                                                                        ;IF LINE NUMBER NOT = 14
2747  012426  017704  002734                MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
2748  012432  017702  002726                MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
2749  012436  027727  002714  000014        CMP     @DHSCR,#14      ;IF LINE BEING COMPARED IS LINE 14
2750  012444  001002                        BNE     5$
2751  012446  005005                        CLR     R5                      ;EXPECTED BYTE COUNT=0
2752  012450  005203                        INC     R3                      ;EXPECTED BUS ADDRESS = 1
2753  012452  020504          5$:           CMP     R5,R4                   ;IS BYTE COUNT CORRECT
2754  012454  001401                        BEQ     6$
2755  012456  104004                        HLT     4                       ;BYTE COUNT ERROR
2756  012460  020302          6$:           CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
2757  012462  001401                        BEQ     7$
2758  012464  104003                        HLT     3                       ;BUS ADDRESS ERROR
2759  012466  005277  002664          7$:   INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
2760  012472  005201                        INC     R1
2761  012474  005300                        DEC     R0                      ;CONTINUE IF ALL NOT DONE
2762  012476  001350                        BNE     4$
2763  012500  104400              8$:       SCOPE                           ;CHECK FOR ITERATIONS, LOOP
2764
2765                                        ;NPR LOGIC TEST
2766                                        ;SET BYTE COUNT ON ALL LINES TO 1
2767                                        ;SET BAR BIT FOR LINE 15
2768                                        ;VERIFY THAT BYTE COUNT FOR LINE 15 GOES TO 0
2769                                        ;VERIFY THAT BUS ADDRESS FOR LINE 15 IS INCREMENTED
2770                                        ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
2771                                        ;ARE UNCHANGED
2772
2773  012502  012767  000340  165266  T45:  MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
```

```
2774  012510  012767  000010  002706          MOV     #10.,ICOUNT             ;SET UP FOR 10 ITERATIONS
2775  012516  012767  012650  002674          MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2776  012524  012777  004000  002624          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2777                                                                          ;TO SET ALL TBMT BITS
2778  012532  004767  002526                  JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
2779                                                                          ;BUS ADDRESS MEMORY LOCATIONS
2780  012536  004767  002554                  JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
2781  012542  012777  020000  002620          MOV     #20000,@DHBAR           ;SET BAR BIT FOR LINE 15
2782  012550  005777  002602          3$:     TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
2783  012554  100375                          BPL     3$
2784  012556  012700  000020                  MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
2785  012562  005077  002570                  CLR     @DHSCR                  ;START AT LINE 0
2786  012566  005001                          CLR     R1                      ;KEEP TRACK OF LINE NUMBER
2787  012570  012705  177777          4$:     MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
2788                                                                          ;IF LINE NUMBER NOT = 15
2789  012574  005003                          CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
2790                                                                          ;IF LINE NUMBER NOT = 15
2791  012576  017704  002564                  MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
2792  012602  017702  002556                  MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
2793  012606  027727  002544  000015          CMP     @DHSCR,#15      ;IF LINE BEING COMPARED IS LINE 15
2794  012614  001002                          BNE     5$
2795  012616  005005                          CLR     R5                      ;EXPECTED BYTE COUNT=0
2796  012620  005203                          INC     R3                      ;EXPECTED BUS ADDRESS = 1
2797  012622  020504          5$:     CMP     R5,R4                   ;IS BYTE COUNT CORRECT
2798  012624  001401                          BEQ     6$
2799  012626  104004                          HLT     4                       ;BYTE COUNT ERROR
2800  012630  020302          6$:     CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
2801  012632  001401                          BEQ     7$
2802  012634  104003                          HLT     3                       ;BUS ADDRESS ERROR
2803  012636  005277  002514          7$:     INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
2804  012642  005201                          INC     R1
2805  012644  005300                          DEC     R0                      ;CONTINUE IF ALL NOT DONE
2806  012646  001350                          BNE     4$
2807  012650  104400          8$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
2808
2809                                  ;NPR LOGIC TEST
2810                                  ;SET BYTE COUNT ON ALL LINES TO 1
2811                                  ;SET BAR BIT FOR LINE 16
2812                                  ;VERIFY THAT BYTE COUNT FOR LINE 16 GOES TO 0
2813                                  ;VERIFY THAT BUS ADDRESS FOR LINE 16 IS INCREMENTED
2814                                  ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
2815                                  ;ARE UNCHANGED
2816
2817  012652  012767  000340  165116  T46:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2818  012660  012767  000010  002536          MOV     #10.,ICOUNT             ;SET UP FOR 10 ITERATIONS
2819  012666  012767  013020  002524          MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2820  012674  012777  004000  002454          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2821                                                                          ;TO SET ALL TBMT BITS
2822  012702  004767  002356                  JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
2823                                                                          ;BUS ADDRESS MEMORY LOCATIONS
2824  012706  004767  002404                  JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
2825  012712  012777  040000  002450          MOV     #40000,@DHBAR           ;SET BAR BIT FOR LINE 16
2826  012720  005777  002432          3$:     TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
2827  012724  100375                          BPL     3$
2828  012726  012700  000020                  MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
2829  012732  005077  002420                  CLR     @DHSCR                  ;START AT LINE 0
```

```
2830  012736  005001                          CLR     R1                      ;KEEP TRACK OF LINE NUMBER
2831  012740  012705  177777          4$:     MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
2832                                                                          ;IF LINE NUMBER NOT = 16
2833  012744  005003                          CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
2834                                                                          ;IF LINE NUMBER NOT = 16
2835  012746  017704  002414                  MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
2836  012752  017702  002406                  MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
2837  012756  027727  002374  000016          CMP     @DHSCR,#16      ;IF LINE BEING COMPARED IS LINE 16
2838  012764  001002                          BNE     5$
2839  012766  005005                          CLR     R5                      ;EXPECTED BYTE COUNT=0
2840  012770  005203                          INC     R3                      ;EXPECTED BUS ADDRESS = 1
2841  012772  020504                  5$:     CMP     R5,R4                   ;IS BYTE COUNT CORRECT
2842  012774  001401                          BEQ     6$
2843  012776  104004                          HLT     4                       ;BYTE COUNT ERROR
2844  013000  020302                  6$:     CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
2845  013002  001401                          BEQ     7$
2846  013004  104003                          HLT     3                       ;BUS ADDRESS ERROR
2847  013006  005277  002344          7$:     INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
2848  013012  005201                          INC     R1
2849  013014  005300                          DEC     R0                      ;CONTINUE IF ALL NOT DONE
2850  013016  001350                          BNE     4$
2851  013020  104400                  8$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
2852
2853                                          ;NPR LOGIC TEST
2854                                          ;SET BYTE COUNT ON ALL LINES TO 1
2855                                          ;SET BAR BIT FOR LINE 17
2856                                          ;VERIFY THAT BYTE COUNT FOR LINE 17 GOES TO 0
2857                                          ;VERIFY THAT BUS ADDRESS FOR LINE 17 IS INCREMENTED
2858                                          ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
2859                                          ;ARE UNCHANGED
2860
2861  013022  012767  000340  164746  T47:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2862  013030  012767  000010  002366          MOV     #10.,ICOUNT             ;SET UP FOR 10 ITERATIONS
2863  013036  012767  013170  002354          MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2864  013044  012777  004000  002304          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2865                                                                          ;TO SET ALL TBMT BITS
2866  013052  004767  002206                  JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
2867                                                                          ;BUS ADDRESS MEMORY LOCATIONS
2868  013056  004767  002234                  JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
2869  013062  012777  100000  002300          MOV     #100000,@DHBAR          ;SET BAR BIT FOR LINE 17
2870  013070  005777  002262          3$:     TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
2871  013074  100375                          BPL     3$
2872  013076  012700  000020                  MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
2873  013102  005077  002250                  CLR     @DHSCR                  ;START AT LINE 0
2874  013106  005001                          CLR     R1                      ;KEEP TRACK OF LINE NUMBER
2875  013110  012705  177777          4$:     MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
2876                                                                          ;IF LINE NUMBER NOT = 17
2877  013114  005003                          CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
2878                                                                          ;IF LINE NUMBER NOT = 17
2879  013116  017704  002244                  MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
2880  013122  017702  002236                  MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
2881  013126  027727  002224  000017          CMP     @DHSCR,#17      ;IF LINE BEING COMPARED IS LINE 17
2882  013134  001002                          BNE     5$
2883  013136  005005                          CLR     R5                      ;EXPECTED BYTE COUNT=0
2884  013140  005203                          INC     R3                      ;EXPECTED BUS ADDRESS = 1
2885  013142  020504                  5$:     CMP     R5,R4                   ;IS BYTE COUNT CORRECT
```

```
 2886  013144  001401                      BEQ     6$
 2887  013146  104004                      HLT     4                       ;BYTE COUNT ERROR
 2888  013150  020302              6$:     CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
 2889  013152  001401                      BEQ     7$
 2890  013154  104003                      HLT     3                       ;BUS ADDRESS ERROR
 2891  013156  005277  002174      7$:     INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
 2892  013162  005201                      INC     R1
 2893  013164  005300                      DEC     R0                      ;CONTINUE IF ALL NOT DONE
 2894  013166  001350                      BNE     4$
 2895  013170  104400              8$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
2896
2897                                    ;SILO LOGIC TEST (MAINTENANCE MODE)
2898                                    ;FORCE 1 CHARACTER INTO SILO USING SILO
2899                                    ;MAINTENANCE BIT
2900                                    ;VERIFY THAT CHARACTER AVAILABLE INTERRUPT OCCURS
2901                                    ;VERIFY THAT CHARACTER AVAILABLE BIT IS
2902                                    ;SET IN SYSTEM CONTROL REGISTER
2903                                    ;VERIFY THAT SILO FILL REGISTER INCREMENTS TO 1
2904                                    ;VERIFY THAT NEXT RECEIVED CHARACTER REGISTER
2905                                    ;VALID DATA BIT IS SET
2906                                    ;VERIFY THAT CORRECT DATA PATTERN WAS RECEIVED
2907
2908  013172  012767  000340  164576  T50:  MOV   #340,PS          ;DISABLE ALL INTERRUPTS
2909  013200  012767  000010  002216        MOV   #10,ICOUNT      ;SET UP FOR 10 ITERATIONS
2910  013206  012767  013350  002204        MOV   #5$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
2911  013214  012777  004000  002134        MOV   #BIT11,@DHSCR   ;MASTER CLEAR INTERFACE
2912  013222  012777  013270  002150        MOV   #2$,@DHRVEC     ;SET UP RECEIVER INTERRUPT
2913  013230  012777  000340  002144        MOV   #340,@DHRLVL    ;VECTOR AND STATUS
2914  013236  052777  100000  002130        BIS   #BIT15,@DHSSR   ;SET SILO MAINTENANCE
2915  013244  012777  000100  002104        MOV   #BIT06,@DHSCR   ;SET RECEIVER INTERRUPT ENABLE
2916  013252  005067  164520                CLR   PS              ;ALLOW INTERRUPTS
2917  013256  012700  001000                MOV   #1000,R0        ;SET UP DELAY FOR SILO LOAD
2918  013262  005300                  1$:   DEC   R0              ;DELAY FOR SILO LOAD
2919  013264  001376                        BNE   1$
2920  013266  104001                        HLT   1               ;NO CHARACTER AVAILABLE INTERRUPT OCCURED
2921  013270  042777  100000  002076  2$:   BIC   #BIT15,@DHSSR   ;CLEAR SILO MAINTENANCE BIT
2922  013276  105777  002054                TSTB  @DHSCR          ;IS CHARACTER AVAILABLE BIT SET
2923  013302  100401                        BMI   3$
2924  013304  104005                        HLT   5               ;CHARACTER AVAILABLE NOT, ERROR
2925  013306  017703  002062          3$:   MOV   @DHSSR,R3       ;READ SILO STATUS REGISTER
2926  013312  017704  002042                MOV   @DHNRC,R4       ;(R4)=ACTUAL DATA IN NEXT
2927                                        ;RECEIVED CHARACTER REGISTER
2928  013316  012705  125252                MOV   #125252,R5      ;(R5)=EXPECTED DATA IN
2929                                        ;NEXT RECEIVED CHARACTER REGISTER
2930  013322  020504                        CMP   R5,R4           ;IS DATA IN SILO CORRECT
2931  013324  001401                        BEQ   4$
2932  013326  104006                        HLT   6               ;SILO DATA ERROR
2933  013330  010304                  4$:   MOV   R3,R4           ;GET SILO STATUS REGISTER
2934  013332  042704  000300                BIC   #300,R4         ;CLEAR UNWANTED BITS
2935  013336  012705  000400                MOV   #400,R5         ;(R5)=EXPECTED DATA
2936                                        ;IN SILO STATUS REGISTER
2937  013342  020504                        CMP   R5,R4           ;CHECK RESULTS
2938  013344  001401                        BEQ   5$
2939  013346  104007                        HLT   7               ;SILO STATUS ERROR
2940  013350  012706  017102          5$:   MOV   #STACK,SP       ;RESTORE STACK
2941  013354  104400                        SCOPE                 ;CHECK FOR ITERATIONS, LOOP
2942
2943                                    ;SILO LOGIC TEST (MAINTENANCE MODE)
2944                                    ;LOAD 63(DECIMAL) CHARACTERS INTO SILO
2945                                    ;VERIFY THAT SILO STATUS REGISTER COUNTS UP CORRECTLY
2946
2947  013356  012767  000340  164412  T51:  MOV   #340,PS          ;DISABLE ALL INTERRUPTS
2948  013364  012767  000001  002032        MOV   #1,ICOUNT       ;SET UP FOR 1 ITERATIONS
2949  013372  012767  013510  002020        MOV   #5$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
2950  013400  012767  013412  002014        MOV   #1$,FREEZ1      ;SET UP TO LOOP WITH DATA
2951  013406  012701  000001                MOV   #1,R1           ;SET UP TO LOAD SILO WITH 1 CHARACTER
```

```
2952  013412  012777  004000  001736  1$:     MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2953  013420  010100                          MOV     R1,R0                   ;SAVE COUNT
2954  013422  005005                          CLR     R5                      ;WILL BE COUNT OF CHARACTERS LOADED
2955  013424  052777  100000  001742  2$:     BIS     #BIT15,@DHSSR           ;LOAD A CHARACTER
2956  013432  012702  001000                  MOV     #1000,R2                ;STALL FOR SILO
2957  013436  005302                  3$:     DEC     R2
2958  013440  001376                          BNE     3$
2959  013442  042777  100000  001724          BIC     #BIT15,@DHSSR           ;CLEAR LOAD BIT
2960  013450  005205                          INC     R5                      ;UPDATE COUNT OF CHARACTERS LOADED
2961  013452  005300                          DEC     R0                      ;IF ALL CHARACTERS NOT LOADED
2962  013454  001363                          BNE     2$                      ;LOAD ANOTHER
2963  013456  017704  001712                  MOV     @DHSSR,R4               ;READ SILO STATUS REGISTER
2964  013462  042704  000300                  BIC     #300,R4                 ;CLEAR UNWANTED BITS
2965  013466  000304                          SWAB    R4                      ;GET DATA INTO LOW BYTE
2966  013470  020504                          CMP     R5,R4                   ;COMPARE
2967  013472  001401                          BEQ     4$
2968  013474  104007                          HLT     7                       ;SILO STATUS ERROR
2969  013476  104410                  4$:     SCOPE1                          ;CHECK FOR LOOP WITH CURRENT
2970                                                                          ;LOAD COUNT (R5)
2971  013500  005201                          INC     R1                      ;ADD 1 TO NUMBER OF CHARACTERS
2972                                                                          ;TO BE LOADED INTO SILO
2973  013502  022701  000100                  CMP     #100,R1                 ;CONTINUE UNTIL SILO IS FULL
2974  013506  001341                          BNE     1$
2975  013510  104400                  5$:     SCOPE
2976
2977                                          ;SILO LOGIC TEST (MAINTENANCE MODE)
2978                                          ;LOAD 64 (DECIMAL CHARACTERS INTO SILO
2979                                          ;READ CHARACTERS OUT OF SILO
2980                                          ;VERIFY THAT SILO STATUS REGISTER COUNTS DOWN CORRECTLY
2981
2982  013512  012767  000340  164256  T52:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2983  013520  012767  000001  001676          MOV     #1,ICOUNT               ;SET UP FOR 1 ITERATIONS
2984  013526  012767  013670  001664          MOV     #7$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2985  013534  012767  013546  001660          MOV     #1$,FREEZ1              ;SET UP TO LOOP WITH DATA
2986  013542  012701  000001                  MOV     #1,R1                   ;SET UP TO READ 1 CHARACTER
2987  013546  012777  004000  001602  1$:     MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2988  013554  012705  000100                  MOV     #100,R5         ;SILO STATUS COUNT SHOULD BE
2989  013560  160105                          SUB     R1,R5                   ;100(OCTAL)-NUMBER
2990                                                                          ;OF CHARACTERS READ
2991  013562  012700  000100                  MOV     #100,R0                 ;SET UP TO LOAD SILO
2992  013566  012702  001000          2$:     MOV     #1000,R2                ;SET UP DELAY
2993  013572  052777  100000  001574          BIS     #BIT15,@DHSSR           ;LOAD 1 CHARACTER
2994  013600  005302                  3$:     DEC     R2                      ;DELAY
2995  013602  001376                          BNE     3$
2996  013604  042777  100000  001562          BIC     #BIT15,@DHSSR           ;CLEAR SILO LOAD BIT
2997  013612  005300                          DEC     R0                      ;CONTINUE IF SILO NOT FULL
2998  013614  001364                          BNE     2$
2999  013616  010100                          MOV     R1,R0                   ;SET UP TO READ SILO
3000  013620  012702  001000          4$:     MOV     #1000,R2                ;SET UP DELAY FOR SILO
3001  013624  005777  001530                  TST     @DHNRC                  ;READ SILO
3002  013630  005302                  5$:     DEC     R2                      ;DELAY FOR SILO
3003  013632  001376                          BNE     5$
3004  013634  005300                          DEC     R0                      ;UPDATE NUMBER OF CHARACTER S TO BE READ
3005  013636  001370                          BNE     4$                      ;CONTINUE READING
3006  013640  117704  001532                  MOVB    @DHSLR,R4               ;READ SILO STATUS REGISER
3007  013644  042704  000300                  BIC     #300,R4                 ;CLEAR UNWANTED BITS
```

```
3008                                                                    ;(R5)=EXPECTED SILO STATUS
3009                                                                    ;(IN UPPER BYTE)
3010                                                                    ;(R4)=ACTUAL SILO STATUS
3011                                                                    ;(IN UPPER BYTE)
3012  013650  020504                    CMP     R5,R4                  ;COMPARE EXPECTED AND RECEIVED DATA
3013  013652  001401                    BEQ     6$
3014  013654  104007                    HLT     7                      ;SILO STATUS ERROR
3015  013656  104410              6$:   SCOPE1                         ;CHECK FOR LOOP WITH SAME READ COUNT
3016  013660  005201                    INC     R1                     ;UPDATE COUNT OF CHARACTERS TO BE READ
3017  013662  020127  000101            CMP     R1,#101          ;CONTINUE IF NOT DONE
3018  013666  001327                    BNE     1$
3019  013670  104400              7$:   SCOPE
```

```
3020
3021                                            ;SILO LOGIC TEST (MAINTENANCE MODE)
3022                                            ;SET SILO ALARM LEVEL TO ALL VALUES 0-77
3023                                            ;VERIFY THAT CHARACTER AVAILABLE FLAG
3024                                            ;DOES NOT SET UNTIL SILO FILL LEVEL IS GREATER THAN
3025                                            ;SILO ALARM LEVEL
3026
3027  013672  012767  000340  164076  T53:    MOV     #340,PS         ;DISABLE ALL INTERRUPTS
3028  013700  012767  000040  001516          MOV     #40,ICOUNT      ;SET UP FOR 40 ITERATIONS
3029  013706  012767  014046  001504          MOV     #5$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
3030  013714  012767  013724  001500          MOV     #1$,FREEZ1      ;SET UP TO LOOP WITH DATA
3031  013722  005005                          CLR     R5              ;START AT ALARM LEVEL 0
3032  013724  012777  004000  001424  1$:     MOV     #BIT11,@DHSCR   ;MASTERCLEAR INTERFACE
3033  013732  010577  001436                  MOV     R5,@DHSSR       ;SET ALARM LEVEL
3034  013736  010501                          MOV     R5,R1           ;SET FILL COUNT
3035  013740  005201                          INC     R1              ;ONE MORE THAN ALARM LEVEL
3036  013742  052777  100000  001424  2$:     BIS     #BIT15,@DHSSR   ;LOAD A CHARACTER
3037  013750  012700  001000                  MOV     #1000,R0        ;WAIT FOR SILO TO SETTLE
3038  013754  005300                          DEC     R0
3039  013756  001376                          BNE     .-2
3040  013760  042777  100000  001406          BIC     #BIT15,@DHSSR   ;CLEAR MAINTENANCE BIT
3041  013766  005301                          DEC     R1              ;UPDATE FILL COUNT
3042  013770  105777  001362                  TSTB    @DHSCR          ;IS CHARACTER AVAILABLE FLAG SET
3043  013774  100406                          BMI     3$              ;YES
3044  013776  005701                          TST     R1              ;CHARACTER AVAILALBE FLAG NOT SET
3045  014000  001360                          BNE     2$              ;SHOULD IT BE
3046  014002  117703  001370                  MOVB    @DHSLR,R3       ;READ SILO FILL LEVEL
3047  014006  104010                          HLT     10              ;SILO ALARM ERROR
3048                                                                  ;NO CHARACTER AVAILABLE WHEN EXPECTED
3049  014010  000406                          BR      4$
3050  014012  020127  000001          3$:     CMP     R1,#1
3051  014016  003403                          BLE     4$
3052  014020  117703  001352                  MOVB    @DHSLR,R3       ;READ SILO FILL LEVEL
3053  014024  104010                          HLT     10              ;SILO ALARM ERROR
3054  014026  104410                  4$:     SCOPE1                  ;CHECK FOR FREEZE AT CURRENT ALARM LEVEL
3055  014030  005705                          TST     R5
3056  014032  001001                          BNE     10$
3057  014034  000261                          SEC
3058  014036  006105                  10$:    ROL     R5              ;GO TO NEXT ALARM LEVEL
3059  014040  022705  000100                  CMP     #100,R5         ;CONTINUE IF NOT DONE
3060  014044  001327                          BNE     1$
3061  014046  104400                  5$:     SCOPE                   ;CHECK FOR ITERATIONS, LOOP
```

```
3062
3063
3064                                    ;END OF PASS
3065                                    ;TYPE NAME OF TEST
3066                                    ;UPDATE PASS COUNT
3067                                    ;CHECK FOR EXIT TO ACT-11
3068                                    ;RESTART TEST
3069
3070  014050  104401              EOP:  TYPE                            ;TYPE NAME OF TEST
3071  014052  016055                    MEPASS
3072  014054  005067  001374           CLR     LAST                    ;CLEAR LAST ERROR PC
3073  014060  005067  001324           CLR     ERRFLG                  ;CLEAR ERROR FLAG
3074  014064  005267  001322           INC     PASCNT                  ;UPDATE PASS COUNT
3075  014070  016767  001316  163472   MOV     PASCNT,LIGHTS           ;DISPLAY PASS COUNT
3076  014076  013701  000042           MOV     @#42,R1                 ;CHECK FOR ACT-11 OR DDP
3077  014102  001405                    BEQ     RESTRT                  ;IF NOT, CONTINUE TESTING
3078  014104  000005                    RESET
3079  014106  004711              LOGICAL:      JSR     PC,(R1)
3080  014110  000240                    NOP
3081  014112  000240                    NOP
3082  014114  000240                    NOP
3083  014116  000167  165120      RESTRT: JMP     BEGIN
3084
3085                                    ;CHECK FOR LOOP ON CURRENT TEST
3086                                    ;CHECK FOR ITERATION SUPPRESSION
3087
3088  014122  032767  002000  163440 SCOPER: BIT     #SW10,SWR
3089  014130  001030                    BNE     4$
3090  014132  032767  040000  163430  1$:     BIT     #SW14,SWR
3091  014140  001021                    BNE     3$
3092  014142  032767  004000  163420          BIT     #SW11,SWR
3093  014150  001006                    BNE     2$
3094  014152  005267  001250           INC     LPCNT
3095  014156  026767  001244  001240   CMP     LPCNT,ICOUNT
3096  014164  001007                    BNE     3$
3097  014166  005067  001234           2$:     CLR     LPCNT
3098  014172  005067  001212           CLR     ERRFLG
3099  014176  011667  001214           MOV     (SP),RETURN
3100  014202  000002                    RTI
3101  014204  016716  001206           3$:     MOV     RETURN,(SP)
3102  014210  000002                    RTI
3103  014212  005767  001172           4$:     TST     ERRFLG
3104  014216  001745                    BEQ     1$
3105  014220  000762                    BR      2$
3106
3107                                    ;CHECK FOR FREEZE ON CURRENT DATA
3108
3109  014222  032767  001000  163340 SCOP1R: BIT     #SW09,SWR
3110  014230  001402                    BEQ     1$
3111  014232  016716  001164           MOV     FREEZ1,(SP)
3112  014236  000002                    1$:     RTI
3113
3114                                    ;ERROR HANDLER
3115
3116  014240  032767  020000  163322 ERRORS: BIT     #SW13,SWR
3117  014246  001051                    BNE     HALTS
```

```
3118  014250  021667  001200                        CMP     (SP),LAST
3119  014254  001404                                BEQ     1$
3120  014256  011667  001172                        MOV     (SP),LAST
3121  014262  005067  001122                        CLR     ERRFLG
3122  014266  104406                        1$:     SAVOSP
3123  014270  011605                                MOV     (SP),R5
3124  014272  162705  000002                        SUB     #2,R5
3125  014276  011504                                MOV     (R5),R4
3126  014300  006304                                ASL     R4
3127  014302  006304                                ASL     R4
3128  014304  042704  177001                        BIC     #177001,R4
3129  014310  062704  016164                        ADD     #ERRTAB,R4
3130  014314  012467  000034                        MOV     (R4)+,ERRMSG
3131  014320  011467  000042                        MOV     (R4),DATABP
3132  014324  005767  001060                        TST     ERRFLG
3133  014330  001403                                BEQ     TYPMSG
3134  014332  005767  000030                        TST     DATABP
3135  014336  001007                                BNE     TYPDAT
3136  014340  104402                TYPMSG: OCTASC
3137  014342  014434                                ERTABO
3138  014344  012767  000001  001036                MOV     #1,ERRFLG
3139  014352  104401                                TYPE
3140  014354  000000                ERRMSG: 0
3141  014356  005767  000004                TYPDAT: TST     DATABP
3142  014362  001402                                BEQ     RESREG
3143  014364  104402                                OCTASC
3144  014366  000000                DATABP: 0
3145  014370  104407                RESREG: RESOS
3146  014372  005767  163172                HALTS:  TST     SWR
3147  014376  100005                                BPL     EXITER
3148  014400  010046                                PUSHRO
3149  014402  016600  000002                        MOV     2(SP),RO
3150  014406  000000                                HALT
3151  014410  012600                                POPRO
3152  014412  005267  000776                EXITER: INC     ERPCNT
3153  014416  032767  002000  163144                BIT     #SW10,SWR
3154  014424  001402                                BEQ     1$
3155  014426  016716  000766                        MOV     ESCAPE,(SP)
3156  014432  000002                        1$:     RTI
3157  014434  000001                ERTABO: 1
3158  014436     006     002                        .BYTE   6,2
3159  014440  015446                                SAVPC
3160                                                ;TRAP DISPATCH SERVICE
3161                                                ;ARGUMENT OF TRAP IS EXTRACTED
3162                                                ;AND USED AS OFFSET TO OBTAIN POINTER
3163                                                ;TO SELECTED SUBROUTINE
3164
3165  014442  011646                TRPSRV: MOV     (SP),-(SP)      ;GET PC OF RETURN
3166  014444  162716  000002                        SUB     #2,(SP)         ;=PC OF TRAP
3167  014450  017616  000000                        MOV     @(SP),(SP)      ;GET TRP
3168  014454  006316                TRPOK:  ASL     (SP)            ;MULTIPLY TRAP ARG BY 2
3169  014456  042716  177001                        BIC     #177001,(SP)    ;CLEAR UNWANTED BITS
3170  014462  062716  016104                        ADD     #TRPTAB,(SP)    ;POINTER TO SUBROUTINE ADDRESS
3171  014466  017616  000000                        MOV     @(SP),(SP)      ;SUBROUTINE ADDRESS
3172  014472  000136                                JMP     @(SP)+          ;GO TO SUBROUTINE
3173
```

```
3174                                                    ;TELETYPE OUTPUT ROUTINE
3175
3176  014474  017605  000000          TYPER:  MOV     @(SP),R5
3177  014500  062716  000002                  ADD     #2,(SP)
3178  014504  105777  000642          1$:     TSTB    @TPCSR
3179  014510  100375                          BPL     1$
3180  014512  105715                          TSTB    (R5)
3181  014514  001001                          BNE     2$
3182  014516  000002                          RTI
3183  014520  112577  000630          2$:     MOVB    (R5)+,@TPDBR
3184  014524  000767                          BR      1$
3185
3186                                                    ;ASCII STRING INPUT ROUTINE
3187
3188  014526  017667  000000  000006  INSTRG: MOV     @(SP),MSG
3189  014534  062716  000002                  ADD     #2,(SP)
3190  014540  104401                  INSTR1: TYPE
3191  014542  000000                  MSG:    0
3192  014544  012704  016126                  MOV     #INBUF,R4
3193  014550  012703  000007                  MOV     #7,R3
3194  014554  105777  000566          1$:     TSTB    @TKCSR
3195  014560  100375                          BPL     1$
3196  014562  117714  000562                  MOVB    @TKDBR,(R4)
3197  014566  142714  000200                  BICB    #200,(R4)
3198  014572  122427  000015                  CMPB    (R4)+,#15
3199  014576  001413                          BEQ     INSTR2
3200  014600  117777  000544  000546          MOVB    @TKDBR,@TPDBR
3201  014606  105777  000540          2$:     TSTB    @TPCSR
3202  014612  100375                          BPL     2$
3203  014614  005303                          DEC     R3
3204  014616  001356                          BNE     1$
3205  014620  104401                  INSTRE: TYPE
3206  014622  015761                          MQM
3207  014624  000745                          BR      INSTR1
3208  014626  000002                  INSTR2: RTI
3209
3210                                                    ;CONVERT ASCII STRING TO OCTAL
3211
3212  014630  011605                  PARAMS: MOV     (SP),R5
3213  014632  012567  000146                  MOV     (R5)+,LOLIM
3214  014636  012567  000144                  MOV     (R5)+,HILIM
3215  014642  012567  000142                  MOV     (R5)+,DEVADR
3216  014646  112567  000140                  MOVB    (R5)+,LOBITS
3217  014652  112567  000135                  MOVB    (R5)+,ADRCNT
3218  014656  010516                          MOV     R5,(SP)
3219  014660  005005                  PARAM1: CLR     R5
3220  014662  012704  016126                  MOV     #INBUF,R4
3221  014666  122714  000015                  CMPB    #15,(R4)
3222  014672  001420                          BEQ     PARERR
3223  014674  121427  000060          1$:     CMPB    (R4),#60
3224  014700  002415                          BLT     PARERR
3225  014702  121427  000067                  CMPB    (R4),#67
3226  014706  003012                          BGT     PARERR
3227  014710  142714  000060                  BICB    #60,(R4)
3228  014714  152405                          BISB    (R4)+,R5
3229  014716  122714  000015                  CMPB    #15,(R4)
```

```
3230  014722  001406                        BEQ     LIMITS
3231  014724  006305                        ASL     R5
3232  014726  006305                        ASL     R5
3233  014730  006305                        ASL     R5
3234  014732  000760                        BR      1$
3235  014734  104404              PARERR:   INSTER
3236  014736  000750                        BR      PARAM1
3237
3238                                        ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
3239
3240  014740  020567  000042      LIMITS:   CMP     R5,HILIM
3241  014744  101373                        BHI     PARERR
3242  014746  020567  000032                CMP     R5,LOLIM
3243  014752  103770                        BLO     PARERR
3244  014754  136705  000032                BITB    LOBITS,R5
3245  014760  001365                        BNE     PARERR
3246
3247                                        ;STORE NUMBER AT SPECIFIED ADDRESS
3248
3249  014762  016704  000022                MOV     DEVADR,R4
3250  014766  010524              1$:       MOV     R5,(R4)+
3251  014770  062705  000002                ADD     #2,R5
3252  014774  105367  000013                DECB    ADRCNT
3253  015000  001372                        BNE     1$
3254  015002  000002                        RTI
3255  015004  000000              LOLIM:    0
3256  015006  000000              HILIM:    0
3257  015010  000000              DEVADR:   0
3258  015012  000000              LOBITS:   0
3259          015013              ADRCNT=LOBITS+1
3260
3261                                        ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
3262
3263  015014  104401              OCTASN:   TYPE
3264  015016  015765                        MCRLF
3265  015020  017601  000000                MOV     @(SP),R1
3266  015024  062716  000002                ADD     #2,(SP)
3267  015030  012167  000130                MOV     (R1)+,WRDCNT
3268  015034  112167  000126      1$:       MOVB    (R1)+,CHRCNT
3269  015040  112167  000123                MOVB    (R1)+,SPACNT
3270  015044  013167  000120                MOV     @(R1)+,BINWRD
3271  015050  016704  000114      2$:       MOV     BINWRD,R4
3272  015054  116705  000106                MOVB    CHRCNT,R5
3273  015060  012700  016140                MOV     #TEMP,R0
3274  015064  010403              3$:       MOV     R4,R3
3275  015066  042703  177770                BIC     #177770,R3
3276  015072  062703  000260                ADD     #260,R3
3277  015076  110320                        MOVB    R3,(R0)+
3278  015100  006204                        ASR     R4
3279  015102  006204                        ASR     R4
3280  015104  006204                        ASR     R4
3281  015106  005305                        DEC     R5
3282  015110  001365                        BNE     3$
3283  015112  012703  016152                MOV     #MDATA,R3
3284  015116  114023              4$:       MOVB    -(R0),(R3)+
3285  015120  105367  000042                DECB    CHRCNT
```

```
                                        BNE     4$
                                        TSTB    SPACNT
                                        BEQ     6$
                        000240  5$:     MOVB    #240,(R3)+
                        000023          DECB    SPACNT
                                        BNE     5$
                        105013  6$:     CLRB    (R3)
                                        TYPE
                                        MDATA
                        000004          DEC     WRDCNT
                                        BNE     1$
                                        RTI
                                WRDCNT: 0
                                CHRCNT: 0
                                SPACNT=CHRCNT+1
                                BINWRD: 0

                                        ;SAVE PC OF TEST THAT FAILED AND R0-R5

                        000004  000246  SVOSP:  MOV     4(SP),SAVPC

                                        ;SAVE R0-R5

                        000236  SVOS:   MOV     R5,SAVR5
                        000230          MOV     R4,SAVR4
                        000222          MOV     R3,SAVR3
                        000214          MOV     R2,SAVR2
                        000206          MOV     R1,SAVR1
                        000200          MOV     R0,SAVR0
                                        RTI

                                        ;RESTORE R0-R5

                        000172  RSOS:   MOV     SAVR0,R0
                        000170          MOV     SAVR1,R1
                        000156          MOV     SAVR2,R2
                        000164          MOV     SAVR3,R3
                        000162          MOV     SAVR4,R4
                        000160          MOV     SAVR5,R5
                                        RTI

                                        ;CLEAR BYTE COUNT AND BUS ADDRESS MEMORIES

                        000020  CLEAR:  MOV     #20,R0          ;SET UPT TO CLEAR 16 (DECIMAL) LOCATIONS
                        000062          CLR     @DHSCR          ;START AT LOCATION 0
                        000066  1$:     CLR     @DHBC           ;CLEAR BYTE COUNT
                        000060          CLR     @DHBA           ;CLEAR BUS ADDRESS
                        000046          INC     @DHSCR          ;ADVANCE LINE NUMBER
                                        DEC     R0              ;CONTINUE IF NOT DONE
                                        BNE     1$
                                        RTS     PC              ;RETURN

                                        ;LOAD ALL BYTE COUNT MEMORY LOCATIONS WITH -1

                        000020  LOAD:   MOV     #20,R0          ;SET UP TO LOAD 16 (DECIMAL) LOCATIONS
                        000030          CLR     @DHSCR          ;START WITH LINE 0
                177777  000032  2$:     MOV     #-1,@DHBC       ;SET BYTE COUNT TO -1
```

```
3342  015334  005277  000016                  INC     @DHSCR                  ;ADVANCE LINE NUMBER
3343  015340  005300                          DEC     R0                      ;CONTINUE IF NOT DONE
3344  015342  001371                          BNE     2$
3345  015344  000207                          RTS     PC                      ;RETURN TO CALLING ROUTINE
3346                                          :INDIRECT POINTERS
3347
3348  015346  177560              TKCSR:  177560
3349  015350  177562              TKDBR:  177562
3350  015352  177564              TPCSR:  177564
3351  015354  177566              TPDBR:  177566
3352  015356  000000              DHSCR:  0
3353  015360  000000              DHNRC:  0
3354  015362  000000              DHLPR:  0
3355  015364  000000              DHBA:   0
3356  015366  000000              DHBC:   0
3357  015370  000000              DHBAR:  0
3358  015372  000000              DHBCR:  0
3359  015374  000000              DHSSR:  0
3360  015376  000000              DHSLR:  0
3361  015400  000000              DHRVEC: 0
3362  015402  000000              DHRLVL: 0
3363  015404  000000              DHTVEC: 0
3364  015406  000000              DHTLVL: 0
3365                                  ;PROGRAM VARIABLES
3366
3367  015410  000000              ERRFLG: 0               ;ERROR FLAG
3368  015412  000000              PASCNT: 0               ;PASS COUNT
3369  015414  000000              ERRCNT: 0               ;ERROR COUNT
3370  015416  000000              RETURN: 0               ;SCOPE RETURN ADDRESS FOR TEST LOOPING
3371  015420  000000              ESCAPE: 0               ;ADDRESS FOR ERROR ESCAPE
3372  015422  000000              FREEZ1: 0               ;DATA LOOPING RETURN ADDRESS
3373  015424  000000              ICOUNT: 0               ;ITERATION COUNT FOR TEST IN PROGRESS
3374  015426  000000              LPCNT:  0               ;NUMBER OF ITERATIONS THIS TEST
3375  015430  000000              SAVR0:  0               ;R0 SAVE AREA
3376  015432  000000              SAVR1:  0               ;R1 SAVE AREA
3377  015434  000000              SAVR2:  0               ;R2 SAVE AREA
3378  015436  000000              SAVR3:  0               ;R3 SAVE ARE
3379  015440  000000              SAVR4:  0               ;R4 SAVE AREA
3380  015442  000000              SAVR5:  0               ;R5 SAVE AREA
3381  015444  000000              SAVSP:  0               ;STACK POINTER SAVE AREA
3382  015446  000000              SAVPC:  0               ;CALLING ROUTINE SAVE AREA
3383  015450  000000              INIFLG: 0               ;PROGRAM INITIALIZATION FLAG
3384  015452  000000              STFLG:  0               ;PROGRAM START FLAG
3385  015454  000000              LAST:   0               ;LAST ERROR PC
3386  015456  000000              HCORE:  0
3387                                  ;ENTER HERE ON POWER FAILURE
3388
3389
3390  015460  010046              PFAIL:  MOV     R0,-(SP)                ;SAVE R0-R5 ON PROCESSOR STACK
3391  015462  010146                      MOV     R1,-(SP)
3392  015464  010246                      MOV     R2,-(SP)
3393  015466  010346                      MOV     R3,-(SP)
3394  015470  010446                      MOV     R4,-(SP)
3395  015472  010546                      MOV     R5,-(SP)
3396  015474  016746  162324              MOV     24,-(SP)
3397  015500  010667  177740              MOV     SP,SAVSP                ;SAVE STACK POINTER
```

```
  3398  015504  012767  015516  162312          MOV     #RESTART,24             ;SET UP FOR POWER UP TRAP
  3399  015512  000000                          HALT                            ;HALT ON POWER DOWN NORMAL
  3400  015514  000777                          BR      .
  3401
  3402                                          ;PROCESSOR WILL TRAP HERE WHEN POWER IS RESTORED
  3403
  3404  015516  016706  177722          RESTAR: MOV     SAVSP,SP                ;RESTORE STACK POINTER
  3405  015522  012605                          MOV     (SP)+,R5                ;RESTORE R0-R5
  3406  015524  012604                          MOV     (SP)+,R4
  3407  015526  012603                          MOV     (SP)+,R3
  3408  015530  012602                          MOV     (SP)+,R2
  3409  015532  012601                          MOV     (SP)+,R1
  3410  015534  012600                          MOV     (SP)+,R0
  3411  015536  012767  015460  162260          MOV     #PFAIL,24               ;SET UP FOR POWER FAILURE
  3412  015544  012767  000340  162224          MOV     #340,PS
  3413  015552  012706  017102                  MOV     #STACK,SP
  3414  015556  005067  000356                  CLR     TEMP
  3415  015562  005267  000352                  INC     TEMP
  3416  015566  001375                          BNE     .-4
  3417  015570  104402                          OCTASC
  3418  015572  015614                          PFTAB
  3419  015574  104401                          TYPE
  3420  015576  015770                          MPFAIL
  3421  015600  005067  177604                  CLR     ERRFLG
  3422  015604  005067  177644                  CLR     LAST
  3423  015610  000177  177602                  JMP     @RETURN
  3424  015614  000001                  PFTAB:  1
  3425  015616  000006  000002                  6,2
  3426  015622  000207                          RETURN
  3427  015624  005015  042012  030510  MTITLE: .ASCIZ  <15><12><12>/DH11 TRANSMITTER AND RECEIVER LOGIC TEST /<15><12>
  3428  015632  020061  051124  047101
  3429  015640  046523  052111  042524
  3430  015646  020122  047101  020104
  3431  015654  042522  042503  053111
  3432  015662  051105  046040  043517
  3433  015670  041511  052040  051505
  3434  015676  020124  005015     000
  3435  015703     015  053012  041505  MVECTO: .ASCIZ  <15><12>/VECTOR ADDRESS-/
  3436  015710  047524  020122  042101
  3437  015716  051104  051505  026523
  3438  015724     000
  3439  015725     015  041412  047117  MREGAD: .ASCIZ  <15><12>/CONTROL REGISTER ADDRESS-/
  3440  015732  051124  046117  051040
  3441  015740  043505  051511  042524
  3442  015746  020122  042101  051104
  3443  015754  051505  026523     000
  3444  015761     040  037440     000  MQM:    .ASCIZ  /  ?/
  3445  015765     015  000012          MCRLF:  .ASCIZ  <15><12>
  3446  015770  020040  047520  042527  MPFAIL: .ASCIZ  /  POWER FAILURE, PROGRAM RESTART AT TEST IN PROGRESS/
  3447  015776  020122  040506  046111
  3448  016004  051125  026105  050040
  3449  016012  047522  051107  046501
  3450  016020  051040  051505  040524
  3451  016026  052122  040440  020124
  3452  016034  042524  052123  044440
  3453  016042  020116  051120  043517
```

```
3454  016050  042522  051523     000
3455  016055     015  042012  042132  MEPASS: .ASCIZ  <15><12>/DZDHC/
3456  016062  041510     000
3457  016065     015  051012     000  MR:     .ASCIZ  <15><12>/R/
3458  016071     015  052012  051505  MTSTPC: .ASCIZ  <15><12>/TEST PC-/
3459  016076  020124  041520  000055
3460
3461                                           ;TABLE OF POINTERS FOR TRAP DECODING
3462
3463  016104  014122                  TRPTAB: SCOPER
3464  016106  014474                          TYPER
3465  016110  015014                          OCTASN
3466  016112  014526                          INSTRG
3467  016114  014620                          INSTRE
3468  016116  014630                          PARAMS
3469  016120  015172                          SVOSP
3470  016122  015232                          RSOS
3471  016124  014222                          SCOP1R
3472
3473                                           ;BUFFERS FOR INPUT-OUTPUT
3474
3475  016126  000000                  INBUF:  0
3476          016140                  .=.+10
3477  016140  000000                  TEMP:   0
3478          016152                  .=.+10
3479  016152  000000                  MDATA:  0
3480          016164                  .=.+10
3481
3482                                           ;TABLE OF POINTERS TO ERROR MESSAGES AND DATA
3483
3484  016164                          ERRTAB:
3485  016164  016230                          EM0
3486  016166  016656                          DT1
3487  016170  016310                          EM1
3488  016172  000000                          0
3489  016174  016325                          EM2
3490  016176  000000                          0
3491  016200  016356                          EM3
3492  016202  016656                          DT1
3493  016204  016415                          EM4
3494  016206  016656                          DT1
3495  016210  016453                          EM5
3496  016212  000000                          0
3497  016214  016507                          EM6
3498  016216  016656                          DT1
3499  016220  016544                          EM7
3500  016222  016656                          DT1
3501  016224  016603                          EM10
3502  016226  016670                          DT2
3503  016230  047125  054105  042520  EM0:    .ASCII  /UNEXPECTED INTERRUPT/
3504  016236  052103  042105  044440
3505  016244  052116  051105  052522
3506  016252  052120
3507  016254  005015  047503  052116          .ASCIZ  <15><12>/CONTROL REGISTER CONTENTS/
3508  016262  047522  020114  042522
3509  016270  044507  052123  051105
```

```
3510  016276  041440  047117  042524
3511  016304  052116  000123
3512  016310  047516  044440  052116  EM1:    .ASCIZ  /NO INTERRUPT/
3513  016316  051105  052522  052120
3514  016324     000
3515  016325     124  040522  051516  EM2:    .ASCIZ  /TRANSMITTER DONE NOT SET/
3516  016332  044515  052124  051105
3517  016340  042040  047117  020105
3518  016346  047516  020124  042523
3519  016354  000124
3520  016356  052502  020123  042101  EM3:    .ASCII  /BUS ADDRESS ERROR/
3521  016364  051104  051505  020123
3522  016372  051105  047522     122
3523  016377     015  042412  050130          .ASCIZ  <15><12>/EXP     REC/
3524  016404  020040  020040  051040
3525  016412  041505     000
3526  016415     102  052131  020105  EM4:    .ASCII  /BYTE COUNT ERROR/
3527  016422  047503  047125  020124
3528  016430  051105  047522     122
3529  016435     015  042412  050130          .ASCIZ  <15><12>/EXP     REC/
3530  016442  020040  020040  051040
3531  016450  041505     000
3532  016453     103  040510  040522  EM5:    .ASCIZ  /CHARACTER AVAILABLE NOT SET/
3533  016460  052103  051105  040440
3534  016466  040526  046111  041101
3535  016474  042514  047040  052117
3536  016502  051440  052105     000
3537  016507     123  046111  020117  EM6:    .ASCII  /SILO DATA ERROR/
3538  016514  040504  040524  042440
3539  016522  051122  051117
3540  016526  005015  054105  020120          .ASCIZ  <15><12>/EXP     REC/
3541  016534  020040  020040  042522
3542  016542  000103
3543  016544  044523  047514  051440  EM7:    .ASCII  /SILO STATUS ERROR/
3544  016552  040524  052524  020123
3545  016560  051105  047522     122
3546  016565     015  042412  050130          .ASCIZ  <15><12>/EXP     REC/
3547  016572  020040  020040  051040
3548  016600  041505     000
3549  016603     123  046111  020117  EM10:   .ASCII  /SILO ALARM ERROR/
3550  016610  046101  051101  020115
3551  016616  051105  047522     122
3552  016623     015  040412  040514          .ASCIZ  <15><12>/ALARM LEVEL  FILL LEVEL/
3553  016630  046522  046040  053105
3554  016636  046105  020040  044506
3555  016644  046114  046040  053105
3556  016652  046105     000
3557          016656                  .EVEN
3558
3559                                  ;DATA TABLES FOR ERROR OUTPUT
3560
3561  016656  000002                  DT1:    2
3562  016660     006     002          .BYTE   6,2
3563  016662  015442                  SAVR5
3564  016664     006     000          .BYTE   6,0
3565  016666  015440                  SAVR4
```

```
  3566  016670  000002                    DT2:    2
  3567  016672      002       014         .BYTE   2,14
  3568  016674  015442                            $AVR5
  3569  016676      002       000         .BYTE   2,0
  3570  016700  015436                            $AVR3
  3571  016702  000000                    ENDCOD: 0
  3572          000001                    .END
```

```
ADRCNT= 015013           3217*  3252*  3259#
BEGIN   001242            528    957    963#  3083
BINWRD  015170           3270*  3271   3301#
BITX  = 000001           1232#  1292#  1352#  1412#  1472#  1532#  1592#  1652#  1712#  1772#  1832#  1892#  1952#
                         2012#  2072#  2132#  2192#  2236#  2280#  2324#  2368#  2412#  2456#  2500#  2544#  2588#
                         2632#  2676#  2720#  2764#  2808#  2852#  2896#
BIT00 = 000001            604#
BIT01 = 000002            603#
BIT02 = 000004            602#
BIT03 = 000010            601#
BIT04 = 000020            600#
BIT05 = 000040            599#
BIT06 = 000100            598#   997   1099   2915
BIT07 = 000200            597#  1101
BIT08 = 000400            596#
BIT09 = 001000            595#  1098   1135   1172   1209
BIT10 = 002000            594#  1175
BIT11 = 004000            593#   990   1024   1058   1093   1130   1167   1204   1243   1303   1363   1423   1483
                         1543   1603   1663   1723   1783   1843   1903   1963   2023   2083   2143   2204   2248
                         2292   2336   2380   2424   2468   2512   2556   2600   2644   2688   2732   2776   2820
                         2864   2911   2952   2987   3032
BIT12 = 010000            592#  1031   1138
BIT13 = 020000            591#  1065   1173   1210   1253   1313   1373   1433   1493   1553   1613   1673   1733
                         1793   1853   1913   1973   2033   2093   2153
BIT14 = 040000            590#  1136
BIT15 = 100000            589#  1212   2914   2921   2955   2959   2993   2996   3036   3040
CHRCNT  015166           3268*  3272   3285*  3299#  3300
CLEAR   015264           1244   1304   1364   1424   1484   1544   1604   1664   1724   1784   1844   1904   1964
                         2024   2084   2144   2206   2250   2294   2338   2382   2426   2470   2514   2558   2602
                         2646   2690   2734   2778   2822   2866   3328#
DATABP  014366           3131*  3134   3141   3144#
DEVADR  015010           3215*  3249   3257#
DHBA    015364           1269   1271   1329   1331   1389   1391   1449   1451   1509   1511   1569   1571   1629
                         1631   1689   1691   1749   1751   1809   1811   1869   1871   1929   1931   1989   1991
                         2049   2051   2109   2111   2169   2171   2220   2264   2308   2352   2396   2440   2484
                         2528   2572   2616   2660   2704   2748   2792   2836   2880   3331*  3355#
DHBAR   015370           1251*  1262   1266   1311*  1322   1326   1371*  1382   1396   1431*  1442   1446   1491*
                         1502   1506   1551*  1562   1566   1611*  1622   1626   1671*  1682   1686   1731*  1742
                         1746   1791*  1802   1806   1851*  1862   1866   1911*  1922   1926   1971*  1982   1986
                         2031*  2042   2046   2091*  2102   2106   2151*  2162   2166   2209*  2253*  2297*  2341*
                         2385*  2429*  2473*  2517*  2561*  2605*  2649*  2693*  2737*  2781*  2825*  2869*  3357#
DHBC    015366           1249*  1279   1281   1309*  1339   1341   1369*  1399   1401   1429*  1459   1461   1489*
                         1519   1521   1549*  1579   1581   1609*  1639   1641   1669*  1699   1701   1729*  1759
                         1761   1789*  1819   1821   1849*  1879   1881   1909*  1939   1941   1969*  1999   2001
                         2029*  2059   2061   2089*  2119   2121   2149*  2179   2181   2219   2263   2307   2351
                         2395   2439   2483   2527   2571   2615   2659   2703   2747   2791   2835   2879   3330*
                         3341*  3356#
DHBCR   015372           3358#
DHLPR   015362           3354#
DHNRC   015360           2926   3001   3353#
DHRLVL  015402            993*  1011   1012*  1027*  1045   1046*  1061*  1079   1080*  1095*  1116   1117*  1132*
                         1153   1154*  1169*  1190   1191*  1206*  1227   1228*  1286   1287*  1346   1347*  1406
                         1407*  1466   1467*  1526   1527*  1586   1587*  1646   1647*  1706   1707*  1766   1767*
                         1826   1827*  1886   1887*  1946   1947*  2006   2007*  2066   2067*  2126   2127*  2186
                         2187*  2913*  3362#
DHRVEC  015400            943    991*  1011*  1025*  1045*  1059*  1079*  1094*  1116*  1131*  1153*  1168*  1190*
```

```
                    1205*  1227*  1286*  1346*  1406*  1466*  1526*  1585*  1646*  1706*  1766*  1826*  1886*
                    1946*  2006*  2066*  2126*  2186*  2912*  3361#
DHSCR   015356       951    990*   997*  1003   1007   1024*  1031*  1037   1041   1058*  1065*  1071   1075
                    1093*  1098*  1099*  1101*  1112   1130*  1135*  1136*  1138*  1149   1167*  1172*  1173*
                    1175*  1186   1204*  1209*  1210*  1212*  1223   1243*  1248*  1253*  1258   1303*  1308*
                    1313*  1318   1363*  1368*  1373*  1378   1423*  1428*  1433*  1438   1483*  1488*  1493*
                    1498   1543*  1548*  1553*  1558   1603*  1608*  1613*  1618   1663*  1668*  1673*  1678
                    1723*  1728*  1733*  1738   1783*  1788*  1793*  1798   1843*  1848*  1853*  1858   1903*
                    1908*  1913*  1918   1963*  1968*  1973*  1978   2023*  2028*  2033*  2038   2083*  2088*
                    2093*  2098   2143*  2148*  2153*  2158   2204*  2210   2213*  2221   2231*  2248*  2254
                    2257*  2265   2275*  2292*  2298   2301*  2309   2319*  2336*  2342   2345*  2353   2363*
                    2380*  2386   2389*  2397   2407*  2424*  2430   2433*  2441   2451*  2468*  2474   2477*
                    2485   2495*  2512*  2518   2521*  2529   2539*  2556*  2562   2565*  2573   2583*  2600*
                    2606   2609*  2617   2627*  2644*  2650   2653*  2661   2671*  2688*  2694   2697*  2705
                    2715*  2732*  2738   2741*  2749   2759*  2776*  2782   2785*  2793   2803*  2820*  2826
                    2829*  2837   2847*  2864*  2870   2873*  2881   2891*  2911*  2915*  2922   2952*  2987*
                    3032*  3042   3329*  3332*  3340*  3342*  3352#
DHSLR   015376       954*   955*  3006   3046   3052   3360#
DHSSR   015374       954   2914*  2921*  2925   2955*  2959*  2963   2993*  2996*  3033*  3036*  3040*  3359#
DHTLVL  015406       996*  1013   1014*  1030*  1047   1048*  1064*  1081   1082*  1097*  1118   1119*  1134*
                    1155   1156*  1171*  1192   1193*  1208*  1229   1230*  1247*  1288   1289*  1307*  1348
                    1349*  1367*  1408   1409*  1427*  1468   1469*  1487*  1528   1529*  1547*  1588   1589*
                    1607*  1648   1649*  1667*  1708   1709*  1727*  1768   1769*  1787*  1828   1829*  1847*
                    1888   1889*  1907*  1948   1949*  1967*  2008   2009*  2027*  2068   2069*  2087*  2128
                    2129*  2147*  2188   2189*  3364#
DHTVEC  015404       994*  1013*  1028*  1047*  1062*  1081*  1096*  1118*  1133*  1155*  1170*  1192*  1207*
                    1229*  1246*  1288*  1306*  1348*  1366*  1408*  1426*  1468*  1486*  1528*  1546*  1588*
                    1606*  1648*  1666*  1708*  1726*  1768*  1786*  1828*  1846*  1888*  1906*  1948*  1966*
                    2008*  2026*  2068*  2086*  2128*  2146*  2188*  3363#
DT1     016656      3486   3492   3494   3498   3500   3561#
DT2     016670      3502   3566#
EM0     016230      3485   3503#
EM1     016310      3487   3512#
EM10    016603      3501   3549#
EM2     016325      3489   3515#
EM3     016356      3491   3520#
EM4     016415      3493   3526#
EM5     016453      3495   3532#
EM6     016507      3497   3537#
EM7     016544      3499   3543#
ENDCOD  016702       576   3571#
EOP     014050      3070#
ERRCNT  015414       910*   3152*  3369#
ERRFLG  015410       911*   912*   3073*  3098*  3103   3121*  3132   3138*  3367#  3421*
ERRMSG  014354      3130*  3140#
ERRORS  014240       869   3116#
ERRTAB  016164      3129   3484#
ERTABO  014434      3137   3157#
ESCAPE  015420       989*  1023*  1057*  1092*  1129*  1166*  1203*  1242*  1302*  1362*  1422*  1482*  1542*
                    1602*  1662*  1722*  1782*  1842*  1902*  1962*  2022*  2082*  2142*  2203*  2247*  2291*
                    2335*  2379*  2423*  2467*  2511*  2555*  2599*  2643*  2687*  2731*  2775*  2819*  2863*
                    2910*  2949*  2984*  3029*  3155   3371#
EXITER  014412      3147   3152#
FREEZ1  015422      2950*  2985*  3030*  3111   3372#
HALTS   014372      3117   3146#
HCORE   015456       921*   922*  3386#
```

```
HILIM   015006          3214*   3240    3256#
ICOUNT  015424           988*   1022*   1056*   1091*   1128*   1165*   1202*   1241*   1301*   1361*   1421*   1481*   1541*
                        1601*   1661*   1721*   1781*   1841*   1901*   1961*   2021*   2081*   2141*   2202*   2246*   2290*
                        2334*   2378*   2422*   2466*   2510*   2554*   2598*   2642*   2686*   2730*   2774*   2818*   2862*
                        2909*   2948*   2983*   3028*   3095    3373#
INBUF   016126          3192    3220    3475#
INIFLG  015450           914     925     956     958*   3383#
INSTER= 104404           886#   3235
INSTR = 104403           885#    938     946     967
INSTRE  014620          3205#   3467
INSTRG  014526          3188#   3466
INSTR1  014540          3190#   3207
INSTR2  014626          3199    3208#
LAST    015454          3072*   3118    3120*   3385#   3422*
LIGHTS= 177570           574#   3075*
LIMITS  014740          3230    3240#
LINE  = 000000          1232#   1292#   1352#   1412#   1472#   1532#   1592#   1652#   1712#   1772#   1832#   1892#   1952#
                        2012#   2072#   2132#   2192#   2236#   2280#   2324#   2368#   2412#   2456#   2500#   2544#   2588#
                        2632#   2676#   2720#   2764#   2808#   2852#   2896#
LOAD    015316          2208    2252    2296    2340    2384    2428    2472    2516    2560    2604    2648    2692    2736
                        2780    2824    2868    3339#
LOBITS  015012          3216*   3244    3258#   3259
LOGICA  014106           892    3079#
LOLIM   015004          3213*   3242    3255#
LPCNT   015426          3094*   3095    3097*   3374#
MCRLF   015765          3264    3445#
MDATA   016152          3283    3294    3479#
MEPASS  016055          3071    3455#
MPFAIL  015770          3420    3446#
MQM     015761          3206    3444#
MR      016065           980    3457#
MREGAD  015725           947    3439#
MSG     014542          3188*   3191#
MTITLE  015624           913    3427#
MTSTPC  016071           968    3458#
MVECTO  015703           939    3435#
N     = 000001             1#
OCTASC= 104402           884#   3136    3143    3417
OCTASN  015014          3263#   3465
PARAM = 104405           887#    940     948     969
PARAMS  014630          3212#   3468
PARAM1  014660          3219#   3236
PARERR  014734          3222    3224    3226    3235#   3241    3243    3245
PASCNT  015412           909*   3074*   3075    3368#
PC    =%000007           569#   1244*   1304*   1364*   1424*   1484*   1544*   1604*   1664*   1724*   1784*   1844*   1904*
                        1964*   2024*   2084*   2144*   2206*   2208*   2250*   2252*   2294*   2296*   2338*   2340*   2382*
                        2384*   2426*   2428*   2470*   2472*   2514*   2516*   2558*   2560*   2602*   2604*   2646*   2648*
                        2690*   2692*   2734*   2736*   2778*   2780*   2822*   2824*   2866*   2868*   3079*   3335*   3345*
PFAIL   015460           867     907    3390#   3411
PFTAB   015614          3418    3424#
POPRO = 012600           583#   3151
POP1SP= 005726           581#
POP2SP= 022626           585#
PS    = 177776           575#    905*    963*    987*    999*   1001*   1021*   1033*   1035*   1055*   1067*   1069*   1090*
                        1103*   1105*   1127*   1140*   1142*   1164*   1177*   1179*   1201*   1214*   1216*   1240*   1254*
                        1300*   1314*   1360*   1374*   1420*   1434*   1480*   1494*   1540*   1554*   1600*   1614*   1660*
```

```
                    1674*  1720*  1734*  1780*  1794*  1840*  1854*  1900*  1914*  1960*  1974*  2020*  2034*
                    2080*  2094*  2140*  2154*  2201*  2245*  2289*  2333*  2377*  2421*  2465*  2509*  2553*
                    2597*  2641*  2685*  2729*  2773*  2817*  2861*  2908*  2916*  2947*  2982*  3027*  3412*
PUSHRO= 010046       582#   3148
PUSH1S= 005746       580#
PUSH2S= 024646       584#
RESREG  014370      3142    3145#
RESTAR  015516      3398    3404#
RESTRT  014116      3077    3083#
RESO5 = 104407       889#   3145
RETURN  015416       976*    981   3099*  3101   3370#  3423
RSO5    015232      3318#   3470
RO    =%000000       562#    917*   919    921   1250*  1255*  1310*  1315*  1370*  1375*  1430*  1435*  1490*
                    1495*  1550*  1555*  1610*  1615*  1670*  1675*  1730*  1735*  1790*  1795*  1850*  1855*
                    1910*  1915*  1970*  1975*  2030*  2035*  2090*  2095*  2150*  2155*  2212*  2233*  2256*
                    2277*  2300*  2321*  2344*  2365*  2388*  2409*  2432*  2453*  2476*  2497*  2520*  2541*
                    2564*  2585*  2608*  2629*  2652*  2673*  2696*  2717*  2740*  2761*  2784*  2805*  2828*
                    2849*  2872*  2893*  2917*  2918*  2953*  2961*  2991*  2997*  2999*  3004*  3037*  3038*
                    3149*  3273*  3277*  3284   3314   3318*  3328*  3333*  3339*  3343*  3390   3410*
R1    =%000001       563#    929*   932*   934*   936   2214*  2232*  2258*  2276*  2302*  2320*  2346*  2364*
                    2390*  2408*  2434*  2452*  2478*  2496*  2522*  2540*  2566*  2584*  2610*  2628*  2654*
                    2672*  2698*  2716*  2742*  2760*  2786*  2804*  2830*  2848*  2874*  2892*  2951*  2953
                    2971*  2973   2986*  2989   2999   3016*  3017   3034*  3035*  3041*  3044   3050   3076*
                    3079   3265*  3267   3268   3269   3270   3313   3319*  3391   3409*
R2    =%000002       564#    930*   932    933*   935*  2220*  2228   2264*  2272   2308*  2316   2352*  2360
                    2396*  2404   2440*  2448   2484*  2492   2528*  2536   2572*  2580   2616*  2624   2660*
                    2668   2704*  2712   2748*  2756   2792*  2800   2836*  2844   2880*  2888   2956*  2957*
                    2992*  2994*  3000*  3002*  3312   3320*  3392   3408*
R3    =%000003       565#    931*   934    935   2217*  2224*  2228   2261*  2268*  2272   2305*  2312*  2316
                    2349*  2356*  2360   2393*  2400*  2404   2437*  2444*  2448   2481*  2488*  2492   2525*
                    2532*  2536   2569*  2576*  2580   2613*  2620*  2624   2657*  2664*  2668   2701*  2708*
                    2712   2745*  2752*  2756   2789*  2796*  2800   2833*  2840*  2844   2877*  2884*  2888
                    2925*  2933   3046*  3052*  3193*  3203*  3274*  3275*  3276*  3277   3283*  3284*  3289*
                    3292*  3311   3321*  3393   3407*
R4    =%000004       566#   1266*  1271*  1281*  1326*  1331*  1341*  1386*  1391*  1401*  1446*  1451*  1461*
                    1506*  1511*  1521*  1566*  1571*  1581*  1626*  1631*  1641*  1686*  1691*  1701*  1746*
                    1751*  1761*  1806*  1811*  1821*  1866*  1871*  1881*  1926*  1931*  1941*  1986*  1991*
                    2001*  2046*  2051*  2061*  2106*  2111*  2121*  2166*  2171*  2181*  2219*  2225   2263*
                    2269   2307*  2313   2351*  2357   2395*  2401   2439*  2445   2483*  2489   2527*  2533
                    2571*  2577   2615*  2621   2659*  2665   2703*  2709   2747*  2753   2791*  2797   2935*
                    2841   2879*  2885   2926*  2930   2933*  2934*  2937   2963*  2964*  2965*  2966   3006*
                    3007*  3012   3125*  3126*  3127*  3128*  3129*  3130   3131   3192*  3196*  3197*  3199
                    3220*  3221   3223   3225   3227*  3228   3229   3249*  3250*  3271*  3274   3278*  3279*
                    3280*  3310   3322*  3394   3406*
R5    =%000005       567#   1003*  1007*  1037*  1041*  1071*  1075*  1112*  1149*  1186*  1223*  1264*  1274*
                    1283*  1324*  1334*  1343*  1384*  1394*  1403*  1444*  1454*  1463*  1504*  1514*  1523*
                    1564*  1574*  1583*  1624*  1634*  1643*  1684*  1694*  1703*  1744*  1754*  1763*  1804*
                    1814*  1823*  1864*  1874*  1883*  1924*  1934*  1943*  1984*  1994*  2003*  2044*  2054*
                    2063*  2104*  2114*  2123*  2164*  2174*  2183*  2215*  2223*  2225   2259*  2267*  2269
                    2303*  2311*  2313   2347*  2355*  2357   2391*  2399*  2401   2435*  2443*  2445   2479*
                    2487*  2489   2523*  2531*  2533   2567*  2575*  2577   2611*  2619*  2621   2655*  2663*
                    2665   2699*  2707*  2709   2743*  2751*  2753   2787*  2795*  2797   2831*  2839*  2841
                    2875*  2883*  2885   2928*  2930   2935*  2937   2954*  2960*  2966   2988*  2989*  3012
                    3031*  3033   3034   3055   3058*  3059   3123*  3124*  3125   3176*  3180   3183   3212*
                    3213   3214   3215   3216   3217   3218   3219*  3228*  3231*  3232*  3233*  3240   3242
                    3244   3250   3251*  3272*  3281*  3309   3323*  3395   3405*
```

DZDHCB.PFC CROSS REFERENCE TABLE -- USER SYMBOLS

```
SAVPC   015446          3159    3305*   3382#
SAVR0   015430          3314*   3318    3375#
SAVR1   015432          3313*   3319    3376#
SAVR2   015434          3312*   3320    3377#
SAVR3   015436          3311*   3321    3378#   3570
SAVR4   015440          3310*   3322    3379#   3565
SAVR5   015442          3309*   3323    3380#   3563    3568
SAVSP   015444          3381#   3397*   3404
SAVOSP= 104406           888#   3122
SCOPE = 104400           882#   1015    1049    1083    1120    1157    1194    1231    1291    1351    1411    1471    1531
                        1591    1651    1711    1771    1831    1891    1951    2011    2071    2131    2191    2235    2279
                        2323    2367    2411    2455    2499    2543    2587    2631    2675    2719    2763    2807    2851
                        2895    2941    2975    3019    3061
SCOPER  014122          3088#   3463
SCOPE1= 104410           890#   2969    3015    3054
SCOP1R  014222          3109#   3471
SIZE    001056           917#
SP     =%000006          568#    906*    964*   1005*   1009*   1039*   1043*   1073*   1077*   1110*   1114*   1147*   1151*
                       1184*   1188*   1221*   1225*   1290*   1350*   1410*   1470*   1530*   1590*   1650*   1710*   1770*
                       1830*   1890*   1950*   2010*   2070*   2130*   2190*   2940*   3099    3101*   3111*   3118    3120
                       3123    3149    3155*   3165*   3166*   3167*   3168*   3169*   3170*   3171*   3172    3176    3177*
                       3188    3189*   3212    3218*   3265    3266*   3305    3390*   3391*   3392*   3393*   3394*   3395*
                       3396*   3397    3404*   3405    3406    3407    3408    3409    3410    3413*
SPACNT= 015167          3269*   3287    3290*   3300#
STACK = 017102           576#    906     964    1290    1350    1410    1470    1530    1590    1650    1710    1770    1830
                       1890    1950    2010    2070    2130    2190    2940    3413
START   001000           874     905#
STFLG   015452           908*    977     979*   3384#
SVOS    015200          3309#
SVOSP   015172          3305#   3469
SWR    = 177570          573#    927     965    3088    3090    3092    3109    3116    3146    3153
SW00   = 000001          556#    927
SW01   = 000002          555#    965
SW02   = 000004          554#
SW03   = 000010          553#
SW04   = 000020          552#
SW05   = 000040          551#
SW06   = 000100          550#
SW08   = 000400          549#
SW09   = 001000          548#   3109
SW10   = 002000          547#   3088    3153
SW11   = 004000          546#   3092
SW12   = 010000          545#
SW13   = 020000          544#   3116
SW14   = 040000          543#   3090
SW15   = 100000          542#
TEMP    016140          3273    3414*   3415*   3477#
TKCSR   015346          3194    3348#
TKDBR   015350          3196    3200    3349#
TPCSR   015352          3178    3201    3350#
TPDBR   015354          3183*   3200*   3351#
TRPOK   014454          3168#
TRPSRV  014442           871    3165#
TRPTAB  016104          3170    3463#
TYPDAT  014356          3135    3141#
TYPE   = 104401          883#    913     980    3070    3139    3190    3205    3263    3293    3419
```

DZDHCB.PFC CROSS REFERENCE TABLE -- USER SYMBOLS

```
TYPER   014474            3176#   3464
TYPMSG  014340            3133    3136#
T1      001334             976     987#
T10     003032            1240#
T11     003270            1300#
T12     003526            1360#
T13     003764            1420#
T14     004222            1480#
T15     004460            1540#
T16     004716            1600#
T17     005154            1660#
T2      001516            1021#
T20     005412            1720#
T21     005650            1780#
T22     006106            1840#
T23     006344            1900#
T24     006602            1960#
T25     007040            2020#
T26     007276            2080#
T27     007534            2140#
T3      001700            1055#
T30     007772            2201#
T31     010142            2245#
T32     010312            2289#
T33     010462            2333#
T34     010632            2377#
T35     011002            2421#
T36     011152            2465#
T37     011322            2509#
T4      002062            1090#
T40     011472            2553#
T41     011642            2597#
T42     012012            2641#
T43     012162            2685#
T44     012332            2729#
T45     012502            2773#
T46     012652            2817#
T47     013022            2861#
T5      002254            1127#
T50     013172            2908#
T51     013356            2947#
T52     013512            2982#
T53     013672            3027#
T6      002446            1164#
T7      002640            1201#
VEC1    001120             915     927#
VEC2    001130             926     929#
WRDCNT  015164            3267*   3295*   3298#
X     = 000000               1#
XBIT  = 000001            1232#   2192#   2896#
XLINE = 000000            1232#   2192#   2896#
XN    = 000054               1#    987     990#   1021    1024#   1055    1058#   1090    1093#   1127    1130#   1164    1167#
                          1201    1204#   1240    1243#   1300    1303#   1360    1363#   1420    1423#   1480    1483#   1540
                          1543#   1600    1603#   1660    1663#   1720    1723#   1780    1783#   1840    1843#   1900    1903#
                          1960    1963#   2020    2023#   2080    2083#   2140    2143#   2201    2204#   2245    2248#   2289
                          2292#   2333    2336#   2377    2380#   2421    2424#   2465    2468#   2509    2512#   2553    2556#
```

```
Y     = 000011
.     = 016704

                2597    2600#   2641    2644#   2685    2688#   2729    2732#   2773    2776#   2817    2820#   2861
2864#   2908    2911#   2947    2951#   2982    2986#   3027    3031#
   1#    882     883#    884#    885#    886#    887#    888#    889#    890#    891#
 606#    607     609     611     613     615     617     619     621     623     625     627     629
 631     633     635     637     639     641     643     645     647     649     651     653     655
 657     659     661     663     665     667     669     671     673     675     677     679     681
 683     685     687     689     691     693     695     697     699     701     703     705     707
 709     711     713     715     717     719     721     723     725     727     729     731     733
 735     737     739     741     743     745     747     749     751     753     755     757     759
 761     763     765     767     769     771     773     775     777     779     781     783     785
 787     789     791     793     795     797     799     801     803     805     807     809     911
 813     815     817     819     821     823     825     827     829     831     833     835     837
 839     841     843     845     847     849     851     853     855     857     859     861     866#
 873#    891#    893#    895#   3039    3400    3416    3476#   3478#   3480#   3557#
```

B07

```
DZDHC   MACY11 27(732)  16-MAR-76  09:17  PAGE 82
DZDHCB.PFC      CROSS REFERENCE TABLE -- MACRO NAMES

CLRBCA     982#   3325
CODEM1     895#    954
HLT        596#   1004   1008   1038   1042   1072   1076   1106   1113   1143   1150   1180   1187   1217   1224
          1257    1261   1268   1277   1285   1317   1321   1328   1337   1345   1377   1381   1388   1397   1405
          1437    1441   1449   1457   1465   1497   1501   1509   1517   1525   1557   1561   1568   1577   1585
          1617    1621   1628   1637   1645   1677   1681   1688   1697   1705   1737   1741   1748   1757   1765
          1797    1801   1808   1817   1825   1857   1861   1868   1877   1885   1917   1921   1928   1937   1945
          1977    1981   1988   1997   2005   2037   2041   2048   2057   2065   2097   2101   2108   2117   2125
          2157    2161   2168   2177   2185   2227   2230   2271   2274   2315   2318   2359   2362   2403   2406
          2447    2450   2491   2494   2535   2538   2579   2582   2623   2626   2667   2670   2711   2714   2755
          2758    2799   2802   2843   2846   2887   2890   2920   2924   2932   2939   2968   3014   3047   3053
INTST1     982#   1016   1050
INTST2     982#   1084   1121   1158   1195
LDBC       982#   3336
NPRTS      982#   1232   1292   1352   1412   1472   1532   1592   1652   1712   1772   1832   1892   1952   2012
          2072    2132
NPRTS2     982#   2192   2236   2280   2324   2368   2412   2456   2500   2544   2588   2632   2676   2720   2764
          2808    2852
TRPDEF       1#    882    883    884    885    986    887    888    889    890
TS           1#    987   1021   1055   1090   1127   1164   1201   1240   1300   1360   1420   1480   1540   1600
          1660    1720   1780   1840   1900   1960   2020   2090   2140   2201   2245   2289   2333   2377   2421
          2465    2509   2553   2597   2641   2685   2729   2773   2817   2861   2908   2947   2982   3027
.BUFFE       1#   3472
.CATCH       1#    605
.ENDCO       1#   3571
.EOP         1#   3063
.ERROR       1#   3113
.ERRTA       1#   3481
.HEADE       1#    520
.INSTR       1#   3185
.MSG         1#   3427
.OCTAS       1#   3260
.PARAM       1#   3209
.PFAIL       1#   3387
.POINT       1#   3346
.RESRE       1#   3316
.SAVRE       1#   3302
.SCOPE       1#   3084
.SCOP1       1#   3106
.SETVE       1#    863
.START       1#    895
.SYMBO       1#    539
.TRPDE       1#    877
.TRPSR       1#   3160
.TRPTA       1#   3460
.TYPER       1#   3173
.VARIA       1#   3365
```

DZDHCB.PFC CROSS REFERENCE TABLE -- PERMANENT SYMBOLS .

```
ADD      934    935   3129   3170   3177   3189   3251   3266   3276
ASL     3126   3127   3168   3231   3232   3233
ASR     3278   3279   3280
BEQ      926    928    966   1263   1270   1280   1323   1330   1340   1383   1390   1400   1443   1450   1460
        1503   1510   1520   1563   1570   1580   1623   1630   1640   1683   1690   1700   1743   1750   1760
        1803   1810   1820   1863   1870   1880   1923   1930   1940   1983   1990   2000   2043   2050   2060
        2103   2110   2120   2163   2170   2180   2226   2229   2270   2273   2314   2317   2358   2361   2402
        2405   2446   2449   2490   2493   2534   2537   2578   2581   2622   2625   2666   2669   2710   2713
        2754   2757   2798   2801   2842   2845   2886   2889   2931   2938   2967   3013   3077   3104   3110
        3119   3133   3142   3154   3199   3222   3230   3288
BGT     3226
BHI     3241
BIC      992   2934   2959   2964   2996   3007   3040   3128   3169   3275
BICB    3197   3227
BIS     1099   1101   1136   1138   1173   1175   1210   1212   1253   1313   1373   1433   1493   1553   1613
        1673   1733   1793   1853   1913   1973   2033   2093   2153   2914   2955   2993   3036
BISB    3228
BIT      92*    965   3088   3090   3092   3109   3116   3153
BITB    3244
BLE     3051
BLO     3243
BLT     3224
BMI     1260   1320   1380   1440   1500   1560   1620   1680   1740   1800   1860   1920   1980   2040   2100
        2160   2923   3043
BNE      915    937    957    978   1256   1316   1376   1436   1496   1556   1616   1676   1736   1796   1856
        1916   1976   2036   2096   2156   2222   2234   2266   2278   2310   2322   2354   2366   2398   2410
        2442   2454   2486   2498   2530   2542   2574   2586   2618   2630   2662   2674   2706   2718   2750
        2762   2794   2806   2838   2850   2882   2894   2919   2958   2962   2974   2995   2998   3003   3005
        3018   3039   3045   3056   3060   3089   3091   3093   3096   3117   3135   3181   3204   3245   3253
        3282   3286   3291   3296   3334   3344   3416
BPL     2211   2255   2299   2343   2387   2431   2475   2519   2563   2607   2651   2695   2739   2793   2827
        2871   3147   3179   3195   3202
BR       920    975   1002   1036   1070   1109   1146   1183   1220   3049   3105   3184   3207   3234   3236
        3400
CLR      908    909    910    911    912    917    933    999   1012   1014   1033   1046   1048   1067   1080
        1082   1103   1117   1119   1140   1154   1156   1177   1191   1193   1214   1228   1230   1254   1264
        1283   1287   1289   1314   1324   1343   1347   1349   1374   1384   1403   1407   1409   1434   1444
        1463   1467   1469   1494   1504   1523   1527   1529   1554   1564   1583   1587   1589   1614   1624
        1643   1647   1649   1674   1684   1703   1707   1709   1734   1744   1763   1767   1769   1794   1804
        1823   1827   1829   1854   1864   1883   1887   1889   1914   1924   1943   1947   1949   1974   1984
        2003   2007   2009   2034   2044   2063   2067   2069   2094   2104   2123   2127   2129   2154   2164
        2183   2187   2189   2213   2214   2217   2223   2257   2258   2261   2257   2301   2302   2305   2311
        2345   2346   2349   2355   2389   2390   2393   2399   2433   2434   2437   2443   2477   2478   2481
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DZDHCB.PFC      CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

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         1963    2012    2023    2072    2083    2132    2143    2192    2204    2236    2248    2280    2292    2324    2336
         2368    2380    2412    2424    2456    2468    2500    2512    2544    2556    2588    2600    2632    2644    2676
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 ERRORS DETECTED:  0
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 RUN-TIME RATIO: 107/45=2.3
 CORE USED:  12K  (23 PAGES)
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Spooler runtime 14 Seconds, 414 KCS, 360 disk reads, 3 disk writes, 83 pages