DH11

DH11 XMIT & REC LOGIC
CZDHCC0

AH-FG22C-MC
1 OF 1 OCT 1985

digital
MADE IN USA

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                .REM !
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IDENTIFICATION

PRODUCT CODE: AC-8452C-MC

PRODUCT NAME: CZDHCCO DH11 TRANSMITTER/RECEIVER LOGIC TEST

DATE: JUNE 1985

MAINTAINER: NAC SOFTWARE ENGINEERING

AUTHOR: MICHAEL DAVIS

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2                                   1.      ABSTRACT
3
4                                           THE DH11 TRANSMITTER AND RECEIVER LOGIC TEST CHECKS
5                                           THE BASIC TRANSMITTER AND RECEIVER FUNCTIONS.
6                                           FUNCTIONS TESTED INCLUDE INTERRUPTS, OPERATION OF
7                                           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 00C2000

                                        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.
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                        4.3 (CONT'D)

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

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

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

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

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

                        4.3.2   PROGRAM RESTART WITH ALL SWITCHES DOWN

                        4.3.2.1 PERFORM 4.3.1.2 TO 4.3.1.5
                        4.3.2.2 THE PROGRAM WILL TYPE "DH11 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.
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                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.
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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 "CZDHC-C" AND THEN RESTART TESTING AT TEST 1 (LOCATION T1 IN THE PROGRAM).

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

5.3.2 PROGRAM START WITH SW00=1

THE PROGRAM WILL PERFORM AS DESCRIBED IN 4.3.1 AND 5.3.1

5.3.3 PROGRAM START WITH SW01=1

5.3.3.1 REFER TO SECTION 4.3.4 FOR INITIAL PROGRAM BEHAVIOR

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

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

5.3.4 PROGRAM OPERATION WITH SW15=1

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

5.3.5 PROGRAM OPERATION WITH SW13=1

SAME AS 5.3.1 EXCEPT THAT NO ERROR TYPEOUTS WILL OCCUR

5.3.6 PROGRAM OPERATION WITH SW11=1

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

5.3.7 PROGRAM OPERATION WITH SW10=1

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

5. (CONT'D)

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

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

6. ERRORS

6.1 ERROR HALTS

THE ERROR MESSAGE FORMAT FOR ALL ERROR TYPEOUTS
IS AS FOLLOWS

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

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

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

6.1.1 ERROR DESCRIPTIONS

SEE LISTING FOR DETAILS OF ERRORS

6.2 ERROR RECOVERY

6.2.1 SW15=0

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

6.2.2 SW15=1

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

6.2.3 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.

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                        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 CZDHC-C TO END OF TYPEOUT OF CZDHC-C)
                                IS GIVEN FOR VARIOUS PROCESSORS IN THE TABLE BELOW

                                                TIME
                                PROCESSOR

                                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


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


                        .LIST   ME
                        .MLIST  MC,MD,CND
                                                                                                ; T
                        ;  CMS REPLACEMENT HISTORY

                        ; *9 SKONETSKI 26-APR-1985 16:23:08 "FIXED TYPO CAUSING ASSEMBLY ERRORS"
                        ; *8 SKONETSKI 22-APR-1985 16:48:03 "TYPO ERROR IN VECTOR CHANGE CODE SOURCE FIXED"
                        ; *7 SKONETSKI 22-APR-1985 16:26:04 "ADDED CODE TO SET VECTORS FOR PWR FAIL, ERRORS, AND EMT
TRAPS."
                        ; *6 SKONETSKI 22-APR-1985 14:22:35 "FIXED BRANCH ERROR IN END OF PASS ROUTINE"
                        ; *5 SKONETSKI 22-APR-1985 08:28:54 "FIXED BUG (AN OCTASC MACRO CALL WAS WRONG) AND ADDED A
CLEAN END OF PASS
MESSAGE.
                        ; *4 SKONETSKI 18-APR-1985 14:20:15 "ADDED SOFTWARE SWITCH REG SUPPORT, BUT UNTESTED"
                        ; *3 SKONETSKI 12-APR-1985 10:34:52 "FIXED PROBLEMS WITH SPURIOUS CR/LFS"
                        ; *2 SKONETSKI 11-APR-1985 16:00:24 "ADDED MACRO FROM SYSMAC.SML THAT SIZES FOR SOFTWARE SWI
TCH REGISTER"
                        ; *1 SKONETSKI 11-APR-1985 15:49:05 "LIBRARY FOR DH11 DIAGNOSTICS"
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      2                                 .LIST   ME
      3                                 .NLIST  MC,MD,CND
      5 000000                          .HEADER +/1972,1976,1985/,+/DH11 TRANSMITTER AND RECEIVER BASIC LOGIC TEST/,+/CZDHC-CO/

                                                ;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>          ; 3
                                                ;PROGRAM WILL TYPE "R" TO INDICATE THAT TESTING HAS STARTED
                                                ;AT THE END OF A PASS, PROGRAM WILL TYPE " CZDHC-CO "
                                                ;AND THEN RESUM TESTING

                                  .TITLE  CZDHC-CO
        000000                    .ENABLE ABS
                                  .NLIST  MC,MD,CND
                                  .LIST   ME
      6 0C0000                    .SYMBOLS

                                  ;SWITCH REGISTER OPTIONS

                100000            SW15=100000           ;=1,HALT ON ERROR
                040000            SW14=40000            ;=1,LOOP ON CURRENT TEST
                020000            SW13=20000            ;=1,INHIBIT ERROR TYPEOUT
                010000            SW12=10000
                004000            SW11=4000             ;=1,INHIBIT ITERATIONS
                002000            SW10=2000             ;=1,ESCAPE TO NEXT TEST ON ERROR                   ; 3
                001000            SW09=1000             ;=1,LOOP WITH CURRENT DATA
                000400            SW08=400
                000100            SW06=100
                000040            SW05=40
                000020            SW04=20
                000010            SW03=10
                000004            SW02=4
                000002            SW01=2                ;RESTART PROGRAM AT SELECTED TEST
                000001            SW00=1                ;RESELECT VECTOR AND CONTROL REGISTER
                                                        ;ADDRESS AFTER PROGRAM RESTART
```

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      0

                        ;REGISTER DEFINITIONS

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

                        ;LOCATION EQUIVALENCIES                                 ; 3

                        ;SWR=177570     ;CONSOLE SWITCH REGISTER                ; 4
                        ;LIGHTS=177570  ;PDP-11/45 DISPLAY REGISTER             ; 4
177776                  PS=177776       ;PROCESSOR STATUS WORD
017270                  STACK=ENDCOD+200    ;START OF PROCESSOR STACK           ; 3

                        ;INSTRUCTION DEFINITIONS

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

```
0
                        000000          .=0
                        000200          .REPT 200
                                                .+2             ;UNEXPECTED TRAP TO THIS LOCATION
                                                HALT            ;EXAMINE STACK TO FIND CAUSE
                                        .ENDR
000000  000002                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000002  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000004  000006                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000006  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000010  000012                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000012  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000014  000016                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000016  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000020  000022                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000022  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000024  000026                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000026  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000030  000032                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000032  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000034  000036                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000036  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000040  000042                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000042  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000044  000046                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000046  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000050  000052                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000052  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000054  000056                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000056  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000060  000062                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000062  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000064  000066                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000066  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000070  000072                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000072  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000074  000076                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000076  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000100  000102                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000102  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000104  000106                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000106  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000110  000112                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000112  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000114  000116                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000116  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000120  000122                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000122  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000124  000126                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000126  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000130  000132                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000132  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000134  000136                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000136  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000140  000142                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000142  000000                                  HALT            ;EXAMINE STACK TO FIND CAUSE
000144  000146                                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
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000146  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000150  000152                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000152  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000154  000156                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000156  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000160  000162                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000152  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000164  000166                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000166  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000170  000172                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000172  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000174  000176                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000176  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000200  000202                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000202  000C00                  HALT            ;EXAMINE STACK TO FIND CAUSE
000204  000206                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000206  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000210  000212                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000212  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000214  000216                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000216  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000220  000222                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000222  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
0C0224  000226                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000226  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000230  000232                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000232  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000234  000236                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000236  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000240  000242                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000242  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000244  000246                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000246  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000250  000252                  .+2             .UNEXPECTED TRAP TO THIS LOCATION
000252  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000254  000256                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000256  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000260  000262                  .+2             ;UNEXPECTED TRAP TO THIS LOCATIO'
000262  000000                  HALT            ;EXA'INE STACK TO FIND CAUSE
000264  000266                  .+2             ;UNEX.'ECTED TRAP TO THIS LOCATION
000266  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000270  000272                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000272  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000274  000276                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000276  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000300  000302                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000302  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000304  000306                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000306  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000310  000312                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000312  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000314  000316                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000316  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000320  000322                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000322  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000324  000326                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000326  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
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000330  000332          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000332  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000334  000336          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000336  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000340  000342          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000342  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000344  000346          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000346  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000350  000352          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000352  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000354  000356          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000356  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000360  000362          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000362  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000364  000366          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000366  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000370  000372          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000372  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000374  000376          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000376  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000400  000402          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000402  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000404  000406          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000406  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000410  000412          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000412  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000414  000416          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000416  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000420  000422          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000422  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000424  000426          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000426  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000430  000432          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000432  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000434  000436          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000436  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000440  000442          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000442  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000444  000446          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000446  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000450  000452          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000452  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000454  000456          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000456  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000460  000462          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000462  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000464  000466          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000466  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000470  000472          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000472  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000474  000476          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000476  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000500  000502          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000502  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000504  000506          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000506  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000510  000512          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
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000512  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000514  000516          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000516  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000520  000522          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000522  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000524  000526          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000526  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000530  000532          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000532  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000534  000536          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000536  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000540  000542          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000542  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000544  000546          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000546  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000550  000552          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000552  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000554  000556          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000556  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000560  000562          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000562  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000564  000566          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000566  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000570  000572          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000572  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000574  000576          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000576  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000600  000602          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000602  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000604  000606          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000606  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000610  000612          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000612  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000614  000616          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000616  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000620  000622          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000622  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000624  000626          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000626  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000630  000632          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000632  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000634  000636          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000636  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000640  000642          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000642  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000644  000646          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000646  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000650  000652          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000652  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000654  000656          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000656  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000660  000662          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000662  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000664  000666          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000666  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
000670  000672          .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000672  000000          HALT            ;EXAMINE STACK TO FIND CAUSE
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000674  000676                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000676  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000700  000702                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000702  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000704  000706                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000706  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000710  000712                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000712  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000714  000716                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000716  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000720  000722                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000722  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000724  000726                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000726  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000730  000732                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000732  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000734  000736                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000736  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000740  000742                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000742  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000744  000746                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000746  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000750  000752                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000752  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000754  000756                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000756  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000760  000762                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000762  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000764  000766                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000766  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000770  000772                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000772  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
000774  000776                  .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000776  000000                  HALT            ;EXAMINE STACK TO FIND CAUSE
  1 001000              .SETVEC
```

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

      1 000204                  .TRPDEF

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

        000204                  TRPDEF  SCOPE,↑/SCOPE LOOP AND ITERATION HANDLER/
                104400                  SCOPE=TRAP+Y            ;SCOPE LOOP AND ITERATION HANDLER
                000001                  Y=Y+1
        000204                  TRPDEF  TYPE,↑/TELETYPE OUTPUT ROUTINE/
                104401                  TYPE=TRAP+Y             ;TELETYPE OUTPUT ROUTINE
                000002                  Y=Y+1
        000204                  TRPDEF  OCTASC,↑/OCTAL TO ASCII CONVERSION/
                104402                  OCTASC=TRAP+Y           ;OCTAL TO ASCII CONVERSION
                000003                  Y=Y+1
        000204                  TRPDEF  INSTR,↑/INPUT ASCII STRING/
                104403                  INSTR=TRAP+Y            ;INPUT ASCII STRING
                000004                  Y=Y+1
        000204                  TRPDEF  INSTER,↑/STRING INPUT ERROR/
                104404                  INSTER=TRAP+Y           ;STRING INPUT ERROR
                000005                  Y=Y+1
        000204                  TRPDEF  PARAM,↑/CONVERT STRING TO OCTAL, CHECK LIMITS/
                104405                  PARAM=TRAP+Y            ;CONVERT STRING TO OCTAL, CHECK LIMITS
                000006                  Y=Y+1
        000204                  TRPDEF  SAVOSP,↑/SAVE R0-R5, PC/
                104406                  SAVOSP=TRAP+Y           ;SAVE R0-R5, PC
                000007                  Y=Y+1
        000204                  TRPDEF  RESOS,↑/RESTORE R0-R5/
                104407                  RESOS=TRAP+Y            ;RESTORE R0-R5
                000010                  Y=Y+1
        000204                  TRPDEF  SCOPE1,↑/CHECK FOR FREEZE ON CURRENT DATA/
                104410                  SCOPE1=TRAP+Y           ;CHECK FOR FREEZE ON CURRENT DATA
                000011                  Y=Y+1
      2         000046          .=46
      3 000046  014232          LOGICAL
      4         000052          .=52
      5 000052  040000          40000
      6                         .MACRO  CODEM1
      7                                 MOV     DHSSR,DHSLR             ;SET UP ADDRESS OF SILO
      8                                 INC     DHSLR                   ;STATUS REGISTER HIGH BYTE
      9                         .ENDM   CODEM1
     10 000054                  .START  DHRVEC,3,4,DHSCR,0,177776,7,10,1,,1
```

```
      0         001000                  .=1000

                                        ;PROGRAM INITIALIZATION
                                        ;LOCK OUT INTERRUPTS
                                        ;SET UP PROCESSOR STACK
                                        ;SET UP POWER FAIL VECTOR
                                        ;CLEAR PROGRAM FLAGS AND COUNTS
                                        ;TYPE TITLE MESSAGE
                                .IIF NB <1>,    ;DETERMINE MEMORY SIZE
                                .IIF NB <>,     ;SET UP TRACE TRAP RETURN

     001000  177570             SWR:    .WORD   177570                  ; SWITCH DHSCR ADDRESS          ; 4
     001002  177570             LIGHTS: .WORD   177570                  ; LIGHTS                        ; 4
                                                                                                        ; 4
     001004  012767  000340  176764  START:  MOV     @340,PS             ;LOCK OUT INTERRUPTS
     001012  012706  017270              MOV     @STACK,SP           ;SET UP PROCESSOR STACK
     001016  012702  000024              MOV     @24,R2              ; POINT TO VECTOR AREA          ; 7
     001022  012722  015616              MOV     @PFAIL,(R2)+        ;SET UP POWER FAIL TRAP         ; 7
     001026  012722  000340              MOV     @340, (R2)+         ;SERVICE AT LEVEL 7             ; 7
     001032  012722  014372              MOV     @ERRORS, (R2)+      ;ERROR HANDLER                  ; 7
     001036  012722  000340              MOV     @340, (R2)+         ;SERVICE AT LEVEL 7             ; 7
     001042  012722  014604              MOV     #TRPSRV, (R2)+      ;GENERAL HANDLER DISPATCH SERVICE ; 7
     001046  012712  000340              MOV     @340, (R2)          ;SERVICE AT LEVEL 7             ; 8
     001052  005067  014532              CLR     STFLG               ;CLEAR TEST START FLAG
     001056  005067  014466              CLR     PASCNT              ;CLEAR PASS COUNT
     001062  005067  014464              CLR     ERRCNT              ;CLEAR ERROR COUNT
     001066  005067  014454              CLR     ERRFLG              ;CLEAR ERROR FLAG
     001072  005067  014450              CLR     ERRFLG              ;CLEAR LAST ERROR PC
     001076  016746  176702              MOV     4, -(SP)            ; PUSH TRAP VECTOR              ; 4
     001102  016746  176700              MOV     6, -(SP)                                            ; 4
     001106  012767  001122  176670      MOV     @1$, 4              ; SET UP TRAP VECTOR            ; 4
     001114  005777  177660              TST     @SWR                ; TEST SWITCH REGISTER ADDRESS  ; 4
     001120  000405                      BR      2$                  ; IF SUCCESSFUL, LEAVE IT ALONE ; 4
     001122                          1$:                                                             ; 4
     001122  012767  000176  177650      MOV     @176, SWR           ; POINT TO SOFT SWITCH DHSCR    ; 4
     001130  005067  177646              CLR     LIGHTS              ; 0 MEANS WE ARE NOT GOING TO USE LIGHTS ; 4
     001134                          2$:                                                             ; 5
     001134  005726                      TST     (SP)+               ; CLEAN UP STACK                ; 4
     001136  005726                      TST     (SP)+                                               ; 4
     001140  012667  176642              MOV     (SP)+, 6                                            ; 4
     001144  012667  176634              MOV     (SP)+, 4                                            ; 4
     001150  104401  015766              TYPE    ,MTITLE             ;TYPE TITLE MESSAGE
     001154  005767  014426              TST     INIFLG              ;CHECK INITIALIZATION FLAG
                                .IF NB  <DHRVEC>
     001160  001021                      BNE     VEC1                ;IF NOT 0, CHECK SWITCHES
                                                                     ;FOR REINITIALIZATION
                                .IFF
                                        BNE     BEGIN               ;IF NOT 0, START TEST
                                .ENDC
                                .IF NB  <1>
     001162  005000             SIZE:   CLR     R0
     001164  012737  001176  000004      MOV     @2$,@#4             ;SET UP TIME OUT RETURN
     001172  005720             1$:     TST     (R0)+               ;WILL TRAP WHEN NO MEMORY       ; 9
     001174  000776                      BR      1$                  ;LOCATION RESPONDED, CONTINUE
     001176  010067  014412     2$:     MOV     R0,HCORE            ;R0 CONTAINS ADDRESS OF
     001202  162767  000002  014404      SUB     @2,HCORE            ;NON EXISTANT MEMORY            ; 9
     001210  012737  000006  000004      MOV     @6,@#4              ;RESTORE TRAPCATCHER
```

```
                                .ENDC
                                .IF NB  <>
                                TRACER: MOV     #1$,@#10                ;SET UP ILLEGAL INSTRUCTION TRAP RETURN
                                        SXT     R0                      ;DO 11/40, 11/45 INSTRUCTION
                                        MOV     #RTT,TRTRET             ;11/40,45 RTT RETURN FROM TRACE TRAP
                                        BR      2$
                                1$:     MOV     #RTI,TRTRET             ;1105,10,20 RTI RETURN FROM TRACE TRAP
                                        MOV     #12,@#10                ;RESTROE TRAPCATCHER
                                        MOV     #TRTRET,@#16            ;SET UP TRACE TRAP VECTOR
                                .ENDC
                                .IF NB  <DHRVEC>                                                        ; 3
                                .IF B   <1>
                                        BR      VEC2
                                .IFF
001216  005767  014364                  TST     INIFLG                  ;IF INITIALIZE FLAG=0
001222  001404                          BEQ     VEC2                    ;GET VECTOR AND CSR ADDRESS
                                .ENDC
001224  032777  000001  177546  VEC1:   BIT     #SW00,@SWR              ;IF SW00=1, GET NEW VECTOR      ; 4
001232  001445                          BEQ     BEGIN                   ;AND CSR
001234                          VEC2:                                                                   ; 4
001234  012701  000300                  MOV     #300,R1                                                 ; 4
001240  012702  000302                  MOV     #302,R2
001244  012703  000004                  MOV     #4,R3
001250  010211                  1$:     MOV     R2,(R1)                 ;RESTORE TRAPCATCHER
001252  005012                          CLR     (R2)                    ;IN FLOATING VECTOR AREA
001254  060301                          ADD     R3,R1
001256  060302                          ADD     R3,R2
001260  020127  001000                  CMP     R1,#1000
001264  001371                          BNE     1$
001266  104403                          INSTR                           ;INPUT ADDRESS OF DEVICE VECTOR
001270  016045                          MVECTOR                         ;MESSAGE "VECTOR ADDRESS-"
001272  104405                          PARAM                           ;CONVERT STRING TO OCTAL
001274  000300                          300                             ;LOW LIMIT
001276  000770                          770                             ;HIGH  LIMIT                    ; 3
001300  015536                          DHRVEC                          ;LOCATIONS TO BE FILLED
001302     003                  .BYTE   3                               ;NUMBER OF LOCATIONS
001303     004                  .BYTE   4                               ;LSB MASK
001304  104403                          INSTR                           ;INPUT ADDRESS OF DEVICE CSR
001306  016067                          MREGAD                          ;MESSAGE "CONTROL REGISTER ADDRESS-"
001310  104405                          PARAM                           ;CONVERT STRING TO OCTAL
001312  000000                          0                               ;LOW LIMIT
001314  177776                          177776                          ;HIGH LIMIT
001316  015514                          DHSCR                           ;LOCATIONS TO BE FILLED
001320     007                  .BYTE   7                               ;NUMBER OF LOCATIONS
001321     010                  .BYTE   10                              ;LSB MASK
                                .ENDC
                                .IF NB  <1>
001322                                  CODEM1
001322  016767  014204  014204          MOV     DHSSR,DHSLR             ;SET UP ADDRESS OF SILO
001330  005267  014200                  INC     DHSLR                   ;STATUS REGISTER HIGH BYTE
                                .ENDC
001334  005767  014246                  TST     INIFLG                  ;IF INITIALIZATION FLAG
001340  001002                          BNE     BEGIN                   ;IS CLEARED
001342  005167  014240                  COM     INIFLG                  ;SET IT

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

```
001346  012767  000340  176422  BEGIN:  MOV     #340,PS         ;LOCK OUT INTERRUPTS
001354  012706  017270                  MOV     #STACK,SP       ;SET UP PROCESSOR STACK
001360  032777  000002  177412          BIT     #SW01,@SWR      ;IF SW01=1              ; 4
001366  001410                          BEQ     1$              ;GET PC FOR PROGRAM START
001370  104403                          INSTR                   ;GET PC
001372  016256                          MTSTPC                  ;MESSAGE "TEST PC"
001374  104405                          PARAM                   ;CONVERT STRING TO OCTAL
001376  000000                          0
001400  017500                          17500
001402  015554                          RETRN
001404     001                  .BYTE   1
001405     001                  .BYTE   1
001406  000410                          BR      2$
001410  012767  001440  014136  1$:     MOV     #T1,RETRN       ;NORMAL START, TEST 1
001416  005767  014166                  TST     STFLG           ;IF LOOPING, BYPASS TYPEOUT
001422  001004                          BNE     3$
001424  005167  014160                  COM     STFLG
001430  104401  016252          2$:     TYPE    ,MR             ;TYPE "R" TO INDICATE START
001434  000177  014114          3$:     JMP     @RETRN          ;START TESTING          ; 3
```

```
 001440                         INTST1  ↑/CHARACTER AVAILABLE/.BIT06
                                        ;INTERRUPT LOGIC TEST
                                        ;SET CHARACTER AVAILABLE INTERRUPT ENABLE
                                        ;VERIFY THAT NO INTERRUPTS OCCUR

 001440                                 TS \XN,4000,3$
 001440  012767  000340  176330 T1:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
 001446  012767  004000  014106         MOV     #4000,ICOUNT            ;SET UP FOR 4000 ITERATIONS
 001454  012767  001574  014074         MOV     #3$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
         000002                 XN=XN+1
 001462  012777  004000  014024         MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
 001470  012777  001544  014040         MOV     #1$,@DHRVEC             ;SET UP FOR POSSIBLE
                                                                        ;RECEIVER INTERRUPT
 001476  012777  000340  014034         MOV     #340,@DHRLVL
 001504  012777  001560  014030         MOV     #2$,@DHTVEC             ;SET UP FOR POSSIBLE
                                                                        ;TRANSMITTER INTERRUPT
 001512  012777  000340  014024         MOV     #340,@DHTLVL
 001520  012777  000100  013766         MOV     #BIT06,@DHSCR           ;SET CHARACTER AVAILABLE
                                                                        ;INTERRUPT ENABLE
 001526  005067  176244                 CLR     PS                      ;ALLOW INTERRUPTS
 001532  000240                         NOP                             ;WINDOW FOR INTERRUPTS
 001534  012767  000340  176234         MOV     #340,PS                 ;NO INTERRUPT OCCURED
 001542  000414                         BR      3$                      ;CONTINUE
 001544  017705  013744         1$:     MOV     @DHSCR,R5               ;GET CONTENTS OF SYSTEM CONTROL REGISTER
 001550                                 HLT     0                       ;UNEXPECTED INTERRUPT
 001550  104000                         EMT     0
 001552  012716  001574                 MOV     #3$,(SP)                        ;SET UP TO
 001556  000002                         RTI                             ;RETURN FROM INTERRUPT
 001560  017705  013730         2$:     MOV     @DHSCR,R5               ;GET CONTENTS OF SYSTEM CONTROL REGISTER
 001564                                 HLT     0                       ;UNEXPECTED INTERRUPT
 001564  104000                         EMT     0
 001566  012716  001574                 MOV     #3$,(SP)                        ;SET UPT TO
 001572  000002                         RTI                             ;RETURN FROM INTERRUPT
 001574  016777  013740  013734 3$:     MOV     DHRLVL,@DHRVEC          ;RESTORE TRAPCATCHER
 001602  005077  013732                 CLR     @DHRLVL
 001606  016777  013732  013726         MOV     DHTLVL,@DHTVEC
 001614  005077  013724                 CLR     @DHTLVL
 001620  104400                         SCOPE                           ;CHECK FOR ITERATIONS, LOOP
2 001622                         INTST1  ↑/SILO OVERFLOW/.BIT12
                                        ;INTERRUPT LOGIC TEST
                                        ;SET SILO OVERFLOW INTERRUPT ENABLE
                                        ;VERIFY THAT NO INTERRUPTS OCCUR

 001622                                 TS \XN,4000,3$
 001622  012767  000340  176146 T2:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
 001630  012767  004000  013724         MOV     #4000,ICOUNT            ;SET UP FOR 4000 ITERATIONS
 001636  012767  001756  013712         MOV     #3$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
         000003                 XN=XN+1
 001644  012777  004000  013642         MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
 001652  012777  001726  013656         MOV     #1$,@DHRVEC             ;SET UP FOR POSSIBLE
                                                                        ;RECEIVER INTERRUPT
```

```
 001660  012777  000340  013652          MOV     #340,@DHRLVL
 001666  012777  001742  013646          MOV     #2$,@DHTVEC             ;SET UP FOR POSSIBLE
                                                                         ;TRANSMITTER INTERRUPT
 001674  012777  000340  013642          MOV     #340,@DHTLVL
 001702  012777  010000  013604          MOV     #BIT12,@DHSCR           ;SET SILO OVERFLOW
                                                                         ;INTERRUPT ENABLE
 001710  005067  176062                  CLR     PS                      ;ALLOW INTERRUPTS
 001714  000240                          NOP                             ;WINDOW FOR INTERRUPTS
 001716  012767  000340  176052          MOV     #340,PS                 ;NO INTERRUPT OCCURED
 001724  000414                          BR      3$                      ;CONTINUE
 001726  017705  013562          1$:     MOV     @DHSCR,R5               ;GET CONTENTS OF SYSTEM CONTROL REGISTER
 001732                                  HLT     0                       ;UNEXPECTED INTERRUPT
 001732  104000                          EMT     0
 001734  012716  001756                  MOV     #3$,(SP)                        ;SET UP TO
 001740  000002                          RTI                             ;RETURN FROM INTERRUPT
 001742  017705  013546          2$:     MOV     @DHSCR,R5               ;GET CONTENTS OF SYSTEM CONTROL RECISTER
 001746                                  HLT     0                       ;UNEXPECTED INTERRUPT
 001746  104000                          EMT     0
 001750  012716  001756                  MOV     #3$,(SP)                        ;SET UPT TO
 001754  000002                          RTI                             ;RETURN FROM INTERRUPT
 001756  016777  013556  013552  3$:     MOV     DHRLVL,@DHRVEC          ;RESTORE TRAPCATCHER
 001764  005077  013550                  CLR     @DHRLVL
 001770  016777  013550  013544          MOV     DHTLVL,@DHTVEC
 001776  005077  013542                  CLR     @DHTLVL
 002002  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
3 002004                          INTST1  +/TRANSMITTER DONE/,BIT13
                                          ;INTERRUPT LOGIC TEST
                                          ;SET TRANSMITTER DONE INTERRUPT ENABLE
                                          ;VERIFY THAT NO INTERRUPTS OCCUR

 002004                           TS \XN,4000,3$
 002004  012767  000340  175764   T3:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
 002012  012767  004000  013542           MOV     #4000,ICOUNT            ;SET UP FOR 4000 ITERATIONS
 002020  012767  002140  013530           MOV     #3$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                          .IF NB  <>
                                  MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA          ; 3
                          .ENDC
         000004           XN=XN+1
 002026  012777  004000  013460           MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
 002034  012777  002110  013474           MOV     #1$,@DHRVEC             ;SET UP FOR POSSIBLE
                                                                         ;RECEIVER INTERRUPT
 002042  012777  000340  013470           MOV     #340,@DHRLVL
 002050  012777  002124  013464           MOV     #2$,@DHTVEC             ;SET UP FOR POSSIBLE
                                                                         ;TRANSMITTER INTERRUPT
 002056  012777  000340  013460           MOV     #340,@DHTLVL
 002064  012777  020000  013422           MOV     #BIT13,@DHSCR           ;SET TRANSMITTER DONE
                                                                         ;INTERRUPT ENABLE
 002072  005067  175700                   CLR     PS                      ;ALLOW INTERRUPTS
 002076  000240                           NOP                             ;WINDOW FOR INTERRUPTS
 002100  012767  000340  175670           MOV     #340,PS                 ;NO INTERRUPT OCCURED
 002106  000414                           BR      3$                      ;CONTINUE
 002110  017705  013400          1$:     MOV     @DHSCR,R5               ;GET CONTENTS OF SYSTEM CONTROL REGISTER
 002114                                   HLT     0                       ;UNEXPECTED INTERRUPT
 002114  104000                           EMT     0
 002116  012716  002140                   MOV     #3$,(SP)                        ;SET UP TO
 002122  000002                           RTI                             ;RETURN FROM INTERRUPT
 002124  017705  013364          2$:     MOV     @DHSCR,R5               ;GET CONTENTS OF SYSTEM CONTROL REGISTER
```

```
002130                                  HLT     0                       ;UNEXPECTED INTERRUPT
002130  104000                          EMT     0
002132  012716  002140                  MOV     #3$,(SP)                        ;SET UPT TO
002136  000002                          RTI                             ;RETURN FROM INTERRUPT
002140  016777  013374  013370  3$:     MOV     DHRLVL,@DHRVEC          ;RESTORE TRAPCATCHER
002146  005077  013366                  CLR     @DHRLVL
002152  016777  013366  013362          MOV     DHTLVL,@DHTVEC
002160  005077  013360                  CLR     @DHTLVL
002164  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
  4 002166                      INTST2  +/CHARACTER AVAILABLE/,BIT07,+/CHARACTER AVAILABLE/,BIT06,1$,2$

                                        ;INTERRUPT LOGIC TEST
                                        ;SET CHARACTER AVAILABLE INTERRUPT ENABLE
                                        ;SET CHARACTER AVAILABLE (MAINTENANCE MODE IS ENABLED
                                        ;VERIFY THAT AN INTERRUPT OCCURS

002166                          TS \XN,4000,3$
002166  012767  000340  175602  T4:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
002174  012767  004000  013360          MOV     #4000,ICOUNT            ;SET UP FOR 4000 ITERATIONS
002202  012767  002332  013346          MOV     #3$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000005                  XN=XN+1
002210  012777  004000  013276          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
002216  012777  002310  013312          MOV     #1$,@DHRVEC             ;SET UP FOR RECEIVER INTERRUPT
002224  012777  000340  013306          MOV     #340,@DHRLVL
002232  012777  002316  013302          MOV     #2$,@DHTVEC             ;SET UP FOR TRANSMITTER INTERRUPT
002240  012777  000340  013276          MOV     #340,@DHTLVL
002246  012777  001000  013240          MOV     #BIT09,@DHSCR           ;SET MAINTENANCE MODE
002254  052777  000100  013232          BIS     #BIT06,@DHSCR           ;SET CHARACTER AVAILABLE
                                                                        ;INTERRUPT ENABLE
002262  052777  000200  013224          BIS     #BIT07,@DHSCR           ;FORCE INTERRUPT BY
                                                                        ;SETTING CHARACTER AVAILABLE
002270  005067  175502                  CLR     PS                      ;ALLOW INTERRUPTS
002274  000240                          NOP                             ;WINDOW FOR INTERRUPTS
00227(  012767  000340  175472          MOV     #340,PS                 ;NO INTERRUPT OCCURED
002304                                  HLT     1                       ;WITH CHARACTER AVAILABLE INTERRUPT
002304  104001                          EMT     1
                                                                        ;ENABLE AND CHARACTER AVAILABLE SET
                                                                        ;ERROR
002306  000411                          BR      3$
002310  012716  002332          1$:     MOV     #3$,(SP)                ;SET UP TO RETURN
002314  000002                          RTI                             ;FROM VALID INTERRUPT
002316  017705  013172          2$:     MOV     @DHSCR,R5               ;GET CONTENTS OF SYSTEM CONTROL REGISTER
002322                                  HLT     0                       ;UNEXPECTED INTERRUPT
002322  104000                          EMT     0
002324  012716  002332                  MOV     #3$,(SP)                        ;SET UP TO RETURN
002330  000002                          RTI                             ;FROM UNEXPECTED INTERRUPT
002332  016777  013202  013176  3$:     MOV     DHRLVL,@DHRVEC          ;RESTORE TRAPCATCHER
002340  005077  013174                  CLR     @DHRLVL
002344  016777  013174  013170          MOV     DHTLVL,@DHTVEC
002352  005077  013166                  CLR     @DHTLVL
002356  104400                          SCOPE
  5 002360                      INTST2  +/SILO OVERFLOW/,BIT12,+/SILO OVERFLOW/,BIT14,1$,2$

                                        ;INTERRUPT LOGIC TEST
```

```
                                        ;SET SILO OVERFLOW INTERRUPT ENABLE
                                        ;SET SILO OVERFLOW (MAINTENANCE MODE IS ENABLED
                                        ;VERIFY THAT AN INTERRUPT OCCURS

002360                          TS \XN,4000,3$
002360  012767  000340  175410  T5:     MOV     #340,PS         ;DISABLE ALL INTERRUPTS
002366  012767  004000  013166          MOV     #4000,ICOUNT    ;SET UP FOR 4000 ITERATIONS
002374  012767  002524  013154          MOV     #3$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1        ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000006                  XN=XN+1
002402  012777  004000  013104          MOV     #BIT11,@DHSCR   ;MASTER CLEAR INTERFACE
002410  012777  002502  013120          MOV     #1$,@DHRVEC     ;SET UP FOR RECEIVER INTERRUPT
002416  012777  000340  013114          MOV     #340,@DHRLVL
002424  012777  002510  013110          MOV     #2$,@DHTVEC     ;SET UP FOR TRANSMITTER INTERRUPT
002432  012777  000340  013104          MOV     #340,@DHTLVL
002440  012777  001000  013046          MOV     #BIT09,@DHSCR   ;SET MAINTENANCE MODE
002446  052777  040000  013040          BIS     #BIT14,@DHSCR   ;SET SILO OVERFLOW
                                                                ;INTERRUPT ENABLE
002454  052777  010000  013032          BIS     #BIT12,@DHSCR   ;FORCE INTERRUPT BY
                                                                ;SETTING SILO OVERFLOW
002462  005067  175310                  CLR     PS              ;ALLOW INTERRUPTS
002466  000240                          NOP                     ;WINDOW FOR INTERRUPTS
002470  012767  000340  175300          MOV     #340,PS         ;NO INTERRUPT OCCURED
002476                                  HLT     1               ;WITH SILO OVERFLOW INTERRUPT
002476  104001                          EMT     1

                                                                ;ENABLE AND SILO OVERFLOW SET
                                                                ;ERROR
002500  000411                          BR      3$
002502  012716  002524          1$:     MOV     #3$,(SP)        ;SET UP TO RETURN
002506  000002                          RTI                     ;FROM VALID INTERRUPT
002510  017705  013000          2$:     MOV     @DHSCR,R5       ;GET CONTENTS OF SYSTEM CONTROL REGISTER
002514                                  HLT     0               ;UNEXPECTED INTERRUPT
002514  104000                          EMT     0
002516  012716  002524                  MOV     #3$,(SP)                ;SET UP TO RETURN
002522  000002                          RTI                     ;FROM UNEXPECTED INTERRUPT
002524  016777  013010  013004  3$:     MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
002532  005077  013002                  CLR     @DHRLVL
002536  016777  013002  012776          MOV     DHTLVL,@DHTVEC
002544  005077  012774                  CLR     @DHTLVL
002550  104400                          SCOPE
  6 002552                      INTST2  +/NON EXISTATN MEMORY/,BIT10,+/TRANSMITTER/,BIT13,2$,1$

                                        ;INTERRUPT LOGIC TEST
                                        ;SET TRANSMITTER INTERRUPT ENABLE
                                        ;SET NON EXISTATN MEMORY (MAINTENANCE MODE IS ENABLED
                                        ;VERIFY THAT AN INTERRUPT OCCURS

002552                          TS \XN,4000,3$
002552  012767  000340  175216  T6:     MOV     #340,PS         ;DISABLE ALL INTERRUPTS
002560  012767  004000  012774          MOV     #4000,ICOUNT    ;SET UP FOR 4000 ITERATIONS
002566  012767  002716  012762          MOV     #3$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1        ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000007                  XN=XN+1
```

```
002574  012777  004000  012712          MOV     @BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
002602  012777  002702  012726          MOV     @2$,@DHRVEC             ;SET UP FOR RECEIVER INTERRUPT
002610  012777  000340  012722          MOV     @340,@DHRLVL
002616  012777  002674  012716          MOV     @1$,@DHTVEC             ;SET UP FOR TRANSMITTER INTERRUPT
002624  012777  000340  012712          MOV     @340,@DHTLVL
002632  012777  001000  012654          MOV     @BIT09,@DHSCR           ;SET MAINTENANCE MODE
002640  052777  020000  012646          BIS     @BIT13,@DHSCR           ;SET TRANSMITTER
                                                                        ;INTERRUPT ENABLE
002646  052777  002000  012640          BIS     @BIT10,@DHSCR           ;FORCE INTERRUPT BY
                                                                        ;SETTING NON EXISTATN MEMORY
002654  005067  175116                  CLR     PS                      ;ALLOW INTERRUPTS
002660  000240                          NOP                             ;WINDOW FOR INTERRUPTS
002662  012767  000340  175106          MOV     @340,PS                 ;NO INTERRUPT OCCURED
002670                                  HLT     1                       ;WITH TRANSMITTER INTERRUPT
002670  104001                          EMT     1

                                                                        ;ENABLE AND NON EXISTATN MEMORY SET
                                                                        ;ERROR
002672  000411                          BR      3$
002674  012716  002716          1$:     MOV     @3$,(SP)                ;SET UP TO RETURN
002700  000002                          RTI                             ;FROM VALID INTEPRUPT
002702  017705  012606          2$:     MOV     @DHSCR,R5               ;GET CONTENTS OF SYSTEM CONTROL REGISTER
002706                                  HLT     0                       ;UNEXPECTED INTERRUPT
002706  104000                          EMT     0
002710  012716  002716                  MOV     @3$,(SP)                        ;SET UP TO RETURN
002714  000002                          RTI                             ;FROM UNEXPECTED INTERRUPT
002716  016777  012616  012612  3$:     MOV     DHRLVL,@DHRVEC          ;RESTORE TRAPCATCHER
002724  005077  012610                  CLR     @DHRLVL
002730  016777  012610  012604          MOV     DHTLVL,@DHTVEC
002736  005077  012602                  CLR     @DHTLVL
002742  104400                          SCOPE
  7 002744                      INTST2  +/TRANSMITTER DONE/,BIT15,+/TRANSMITTER DONE/,BIT13,2$,1$

                                        ;INTERRUPT LOGIC TEST
                                        ;SET TRANSMITTER DONE INTERRUPT ENABLE
                                        ;SET TRANSMITTER DONE (MAINTENANCE MODE IS ENABLED
                                        ;VERIFY THAT AN INTERRUPT OCCURS

002744                          TS \XN,4000,3$
002744  012767  000340  175024  T7:     MOV     @340,PS                 ;DISABLE ALL INTERRUPTS
002752  012767  004000  012602          MOV     @4000,ICOUNT            ;SET UP FOR 4000 ITERATIONS
002760  012767  003110  012570          MOV     @3$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                              .IF NB    <>
                                        MOV     @,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                              .ENDC
        000010                XN=XN+1
002766  012777  004000  012520          MOV     @BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
002774  012777  003074  012534          MOV     @2$,@DHRVEC             ;SET UP FOR RECEIVER INTERRUPT
003002  012777  000340  012530          MOV     @340,@DHRLVL
003010  012777  003066  012524          MOV     @1$,@DHTVEC             ;SET UP FOR TRANSMITTER INTERRUPT
003016  012777  000340  012520          MOV     @340,@DHTLVL
003024  012777  001000  012462          MOV     @BIT09,@DHSCR           ;SET MAINTENANCE MODE
003032  052777  020000  012454          BIS     @BIT13,@DHSCR           ;SET TRANSMITTER DONE
                                                                        ;INTERRUPT ENABLE
003040  052777  100000  012446          BIS     @BIT15,@DHSCR           ;FORCE INTERRUPT BY
                                                                        ;SETTING TRANSMITTER DONE
003046  005067  174724                  CLR     PS                      ;ALLOW INTERRUPTS
003052  000240                          NOP                             ;WINDOW FOR INTERRUPTS
```

```
003054  012767  000340  174714          MOV     #340,PS         ;NO INTERRUPT OCCURED
003062                                  HLT     1               ;WITH TRANSMITTER DONE INTERRUPT
003062  104001                          EMT     1

                                                                ;ENABLE AND TRANSMITTER DONE SET
                                                                ;ERROR
003064  000411                          BR      3$
003066  012716  003110          1$:     MOV     #3$,(SP)        ;SET UP TO RETURN
003072  000002                          RTI                     ;FROM VALID INTERRUPT
003074  017705  012414          2$:     MOV     @DHSCR,R5       ;GET CONTENTS OF SYSTEM CONTROL REGISTER
003100                                  HLT     0               ;UNEXPECTED INTERRUPT
003100  104000                          EMT     0
003102  012716  003110                  MOV     #3$,(SP)                ;SET UP TO RETURN
003106  000002                          RTI                     ;FROM UNEXPECTED INTERRUPT
003110  016777  012424  012420  3$:     MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
003116  005077  012416                  CLR     @DHRLVL
003122  016777  012416  012412          MOV     DHTLVL,@DHTVEC
003130  005077  012410                  CLR     @DHTLVL
003134  104400                          SCOPE
    9           000000                  LINE=0
   10           000000                  XLINE='.INE
   11           000001                  BITX=1
   12           000001                  XBIT=BITX
   14           000020                  .REPT   20
   15                                   NPRTS   \LINE,\BITX
   16                                   .NLIST
   17                                           LINE=LINE+1
   18                                   BITX=BITX+BITX
   19                                   .LIST
   20                                   .ENDR
003136                                  NPRTS   \LINE,\BITX

                                                ;NPR LOGIC TEST
                                                ;SET BYTE COUNT TO 1 FOR LINE 0
                                                ;SET BAR BIT FOR LINE 0
                                                ;DELAY FOR NPR
                                                ;VERIFY THAT BAR BIT FOR LINE 0 CLEARS
                                                ;VERIFY THAT TRANSMITTER DONE IS SET

003136                                  TS \XN,20,6$
003136  012767  000340  174632  T10:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
003144  012767  000020  012410          MOV     #20,ICOUNT              ;SET UP FOR 20 ITERATIONS
003152  012767  003366  012376          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                        .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                        .ENDC
        000011                          XN=XN+1
003160  012777  004000  012326          MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
003166  004767  012230                  JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
                                                                        ;AND BYTE COUNT MEMORY LOCATIONS
003172  012777  003254  012342          MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
003200  012777  000340  012336          MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
003206  012777  000000  012300          MOV     #0,@DHSCR               ;SELECT LINE 0
003214  012777  177777  012302          MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
003222  012700  001000                  MOV     #1000,R0
003226  012777  000001  012272          MOV     #1,@DHBAR               ;SET BAR BIT FOR
                                                                        ;LINE 0
003234  052777  020000  012252          BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
```

```
003242  005067  174530              CLR     PS                      ;ALLOW INTERRUPTS
003246  005300              1$:     DEC     R0                      ;DELAY FOR NPR
003250  001376                      BNE     1$
003252                              HLT     1                       ;NO INTERRUPT OCCURED, ERROR
003252  104001                      EMT     1
003254  005777  012234          2$: TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
                                                                    ;DONE IS SET
003260  100401                      BMI     3$
003262                              HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
003262  104002                      EMT     2
003264  005777  012236          3$: TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 0
003270  001404                      BEQ     4$
003272  005005                      CLR     R5                      ;(R5)=EXPECTED DATA IN
                                                                    ;BUFFER ACTIVE REGISTER, 0
003274  017704  012226              MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
                                                                    ;BUFFER ACTIVE REGISTER
003300                              HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
003300  104000                      EMT     0
003302  022777  000001  012212  4$: CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
003310  001405                      BEQ     5$
003312  017704  012204              MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
                                                                    ;OF BUS ADDRESS MEMORY FOR
                                                                    ;LINE 0
003316  012705  000001              MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
                                                                    ;BUS ADDRESS MEMORY FOR
                                                                    ;LINE 0, 1
003322                              HLT     3                       ;BUS ADDRESS NOT UPDATED
003322  104003                      EMT     3
                                                                    ;CORRECTLY, ERROR
003324  005777  012174          5$: TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
003330  001416                      BEQ     6$
003332  017704  012166              MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
                                                                    ;COUNT FOR LINE 0
003336  005005                      CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
                                                                    ;COUNT FOR LINE 0, 0
003340                              HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
003340  104004                      EMT     4
003342  016777  012172  012166      MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
003350  005077  012164              CLR     @DHRLVL
003354  016777  012164  012160      MOV     DHTLVL,@DHTVEC
003362  005077  012156              CLR     @DHTLVL
003366  012706  017270          6$: MOV     #STACK,SP               ;RESTORE STACK
003372  104400                      SCOPE                           ;CHECK FOR ITERATIONS, LOOP
        000001                      LINE=LINE+1
        000002              BITX=BITX+BITX
003374                      NPRTS   \LINE,\BITX

                                    ;NPR LOGIC TEST
                                    ;SET BYTE COUNT TO 1 FOR LINE 1
                                    ;SET BAR BIT FOR LINE 1
                                    ;DELAY FOR NPR
                                    ;VERIFY THAT BAR BIT FOR LINE 1 CLEARS
                                    ;VERIFY THAT TRANSMITTER DONE IS SET

003374                      TS \XN,20,6$
003374  012767  000340  174374  T11: MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
003402  012767  000020  012152      MOV     #20,ICOUNT              ;SET UP FOR 20 ITERATIONS
```

```
003410  012767  003624  012140          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     4,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000012                  XN=XN+1
003416  012777  004000  012070          MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
003424  004767  011772                  JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
                                                                        ;AND BYTE COUNT MEMORY LOCATIONS
003430  012777  003512  012104          MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
003436  012777  000340  012100          MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
003444  012777  000001  012062          MOV     #1,@DHSCR               ;SELECT LINE 1
003452  012777  177777  012044          MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
003460  012700  001000                  MOV     #1000,R0
003464  012777  000002  012034          MOV     #2,@DHBAR               ;SET BAR BIT FOR
                                                                        ;LINE 1
003472  052777  020000  012014          BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
003500  005067  174272                  CLR     PS                      ;ALLOW INTERRUPTS
003504  005300                  1$:     DEC     R0                      ;DELAY FOR NPR
003506  001376                          BNE     1$
003510                                  HLT     1                       ;NO INTERRUPT OCCUPED, ERROR
003510  104001                          EMT     1
003512  005777  011776          2$:     TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
                                                                        ;DONE IS SET
003516  100401                          BMI     3$
003520                                  HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
003520  104002                          EMT     2
003522  005777  012000          3$:     TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 1
003526  001404                          BEQ     4$
003530  005005                          CLR     R5                      ;(R5)=EXPECTED DATA IN
                                                                        ;BUFFER ACTIVE REGISTER, 0
003532  017704  011770                  MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
                                                                        ;BUFFER ACTIVE REGISTER
003536                                  HLT     0                       ;BUS ACTIVF BIT NOT CLEARED, ERROR
003536  104000                          EMT     0
003540  022777  000001  011754  4$:     CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
003546  001405                          BEQ     5$
003550  017704  011746                  MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
                                                                        ;OF BUS ADDRESS MEMORY FOR
                                                                        ;LINE 1
003554  012705  000001                  MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
                                                                        ;BUS ADDRESS MEMORY FOR
                                                                        ;LINE 1, 1
003560                                  HLT     3                       ;BUS ADDRESS NOT UPDATED
003560  104003                          EMT     3
                                                                        ;CORRECTLY, ERROR
003562  005777  011736          5$:     TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
003566  001416                          BEQ     6$
003570  017704  011730                  MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
                                                                        ;COUNT FOR LINE 1
003574  005005                          CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
                                                                        ;COUNT FOR LINE 1, 0
003576                                  HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
003576  104004                          EMT     4
003600  016777  011734  011730          MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
003606  005077  011726                  CLR     @DHRLVL
003612  016777  011726  011722          MOV     DHTLVL,@DHTVEC
003620  005077  011720                  CLR     @DHTLVL
```

```
003624  012706  017270          6$:     MOV     #STACK,SP               ;RESTORE STACK
003630  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
        000002                          LINE=LINE+1
        000004                  BITX=BITX+BITX
003632                          NPRTS   \LINE,\BITX

                                        ;NPR LOGIC TEST
                                        ;SET BYTE COUNT TO 1 FOR LINE 2
                                        ;SET BAR BIT FOR LINE 2
                                        ;DELAY FOR NPR
                                        ;VERIFY THAT BAR BIT FOR LINE 2 CLEARS
                                        ;VERIFY THAT TRANSMITTER DONE IS SET

003632                          TS \XN,20,6$
003632  012767  000340  174136  T12:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
003640  012767  000020  011714          MOV     #20,ICOUNT              ;SET UP FOR 20 ITERATIONS
003646  012767  004062  011702          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000013                  XN=XN+1
003654  012777  004000  011632          MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
003662  004767  011534                  JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
                                                                        ;AND BYTE COUNT MEMORY LOCATIONS
003666  012777  003750  011646          MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
003674  012777  000340  011642          MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
003702  012777  000002  011604          MOV     #2,@DHSCR               ;SELECT LINE 2
003710  012777  177777  011606          MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
003716  012700  001000                  MOV     #1000,R0
003722  012777  000004  011576          MOV     #4,@DHBAR               ;SET BAR BIT FOR
                                                                        ;LINE 2
003730  052777  020000  011556          BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
003736  005067  174034                  CLR     PS                      ;ALLOW INTERRUPTS
003742  005300                  1$:     DEC     R0                      ;DELAY FOR NPR
003744  001376                          BNE     1$
003746                                  HLT     1                       ;NO INTERRUPT OCCURED, ERROR
003746  104001                          EMT     1
003750  005777  011540          2$:     TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
                                                                        ;DONE IS SET
003754  100401                          BMI     3$
003756                                  HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
003756  104002                          EMT     2
003760  005777  011542          3$:     TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 2
003764  001404                          BEQ     4$
003766  005005                          CLR     R5                      ;(R5)=EXPECTED DATA IN
                                                                        ;BUFFER ACTIVE REGISTER, 0
003770  017704  011532                  MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
                                                                        ;BUFFER ACTIVE REGISTER
003774                                  HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
003774  104000                          EMT     0
003776  022777  000001  011516  4$:     CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
004004  001405                          BEQ     5$
004006  017704  011510                  MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
                                                                        ;OF BUS ADDRESS MEMORY FOR
                                                                        ;LINE 2
004012  012705  000001                  MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
                                                                        ;BUS ADDRESS MEMORY FOR
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                                                                ;LINE 2, 1
004016                                  HLT     3               ;BUS ADDRESS NOT UPDATED
004016  104003                          EMT     3

                                                                ;CORRECTLY, ERROR
004020  005777  011500         5$:     TST     @DHBC           ;DID BYTE COUNT DECREMENT TO 0
004024  001416                          BEQ     6$
004026  017704  011472                  MOV     @DHBC,R4        ;(R4)=ACTUAL VALUE OF BYTE
                                                                ;COUNT FOR LINE 2
004032  005005                          CLR     R5              ;(R5)=EXPECTED VALUE OF BYTE
                                                                ;COUNT FOR LINE 2, 0
004034                                  HLT     4               ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
004034  104004                          EMT     4
004036  016777  011476  011472         MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
004044  005077  011470                  CLR     @DHRLVL
004050  016777  011470  011464         MOV     DHTLVL,@DHTVEC
004056  005077  011462                  CLR     @DHTLVL
004062  012706  017270         6$:     MOV     #STACK,SP       ;RESTORE STACK
004066  104400                          SCOPE                   ;CHECK FOR ITERATIONS, LOOP
        000003                          LINE=LINE+1
        000010                  BITX=BITX+BITX
004070                          NPRTS   \LINE,\BITX

                                        ;NPR LOGIC TEST
                                        ;SET BYTE COUNT TO 1 FOR LINE 3
                                        ;SET BAR BIT FOR LINE 3
                                        ;DELAY FOR NPR
                                        ;VERIFY THAT BAR BIT FOR LINE 3 CLEARS
                                        ;VERIFY THAT TRANSMITTER DONE IS SET

004070                          IS \XN,20,6$
004070                          TS \XN,20,6$
004070  012767  000340  173700 T13:     MOV     #340,PS         ;DISABLE ALL INTERRUPTS
004076  012767  000020  011456          MOV     #20,ICOUNT      ;SET UP FOR 20 ITERATIONS
004104  012767  004320  011444          MOV     #6$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1        ;SET UP TO LO   WITH DATA       ; 3
                                .ENDC
        000014                  XN=XN+1
004112  012777  004000  011374          MOV     #BIT11,@DHSCR   ;ISSUE MASTER CLEAR
004120  004767  011276                  JSR     PC,CLEAR        ;CLEAR ALL BUS ADDRESS
                                                                ;AND BYTE COUNT MEMORY LOCATIONS
004124  012777  004206  011410          MOV     #2$,@DHTVEC     ;SET UP TRANSMITTER
004132  012777  000340  011404          MOV     #340,@DHTLVL    ;INTERRUPT VECTOR
004140  012777  000003  011346          MOV     #3,@DHSCR       ;SELECT LINE 3
004146  012777  177777  011350          MOV     #-1,@DHBC       ;SET BYTE COUNT TO 1
004154  012700  001000                  MOV     #1000,R0
004160  012777  000010  011340          MOV     #10,@DHBAR      ;SET BAR BIT FOR
                                                                ;LINE 3
004166  052777  020000  011320          BIS     #BIT13,@DHSCR   ;SET TRANSMITTER INTERRUPT ENABLE
004174  005067  173576                  CLR     PS              ;ALLOW INTERRUPTS
004200  005300         1$:     DEC     R0                      ;DELAY FOR NPR
004202  001376                  BNE     1$
004204                          HLT     1                       ;NO INTERRUPT OCCURED, ERROR
004204  104001                  EMT     1
004206  005777  011302         2$:     TST     @DHSCR          ;VERIFY THAT TRANSMITTER
                                                                ;DONE IS SET
004212  100401                  BMI     3$
004214                          HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
```

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004214  104002                          EMT     2
004216  005777  011304          3$:     TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 3
004222  001404                          BEQ     4$
004224  005005                          CLR     R5                      ;(R5)=EXPECTED DATA IN
                                                                        ;BUFFER ACTIVE REGISTER, 0
004226  017704  011274                  MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
                                                                        ;BUFFER ACTIVE REGISTER
004232                                  HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
004232  104000                          EMT     0
004234  022777  000001  011260  4$:     CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
004242  001405                          BEQ     5$
004244  017704  011252                  MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
                                                                        ;OF BUS ADDRESS MEMORY FOR
                                                                        ;LINE 3
004250  012705  000001                  MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
                                                                        ;BUS ADDRESS MEMORY FOR
                                                                        ;LINE 3, 1
004254                                  HLT     3                       ;BUS ADDRESS NOT UPDATED
004254  104003                          EMT     3
                                                                        ;CORRECTLY, ERROR
004256  005777  011242          5$:     TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
004262  001416                          BEQ     6$
004264  017704  011234                  MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
                                                                        ;COUNT FOR LINE 3
004270  005005                          CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
                                                                        ;COUNT FOR LINE 3, 0
004272                                  HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
004272  104004                          EMT     4
004274  016777  011240  011234          MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
004302  005077  011232                  CLR     @DHRLVL
004306  016777  011232  011226          MOV     DHTLVL,@DHTVEC
004314  005077  011224                  CLR     @DHTLVL
004320  012706  017270          6$:     MOV     #STACK,SP               ;RESTORE STACK
004324  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
        000004                          LINE=LINE+1
        000020                  BITX=BITX+BITX
004326                          NPRTS   \LINE,\BITX

                                        ;NPR LOGIC TEST
                                        ;SET BYTE COUNT TO 1 FOR LINE 4
                                        ;SET BAR BIT FOR LINE 4
                                        ;DELAY FOR NPR
                                        ;VERIFY THAT BAR BIT FOR LINE 4 CLEARS
                                        ;VERIFY THAT TRANSMITTER DONE IS SET

004326                          TS \XN,20,6$
004326  012767  000340  173442  T14:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
004334  012767  000020  011220          MOV     #20,ICOUNT              ;SET UP FOR 20 ITERATIONS
004342  012767  004556  011206          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000015                  XN=XN+1
004350  012777  004000  011136          MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
004356  004767  011040                  JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
                                                                        ;AND BYTE COUNT MEMORY LOCATIONS
004362  012777  004444  011152          MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
```

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004370  012777  000340  011146          MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
004376  012777  000004  011110          MOV     #4,@DHSCR               ;SELECT LINE 4
004404  012777  177777  011112          MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
004412  012700  001000                  MOV     #1000,R0
004416  012777  000020  011102          MOV     #20,@DHBAR              ;SET BAR BIT FOR
                                                                        ;LINE 4
004424  052777  020000  011062          BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
004432  005067  173340                  CLR     PS                      ;ALLOW INTERRUPTS
004436  005300                  1$:     DEC     R0                      ;DELAY FOR NPR
004440  001376                          BNE     1$
004442                                  HLT     1                       ;NO INTERRUPT OCCURED, ERROR
004442  104001                          EMT     1
004444  005777  011044          2$:     TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
                                                                        ;DONE IS SET
004450  100401                          BMI     3$
004452                                  HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
004452  104002                          EMT     2
004454  005777  011046          3$:     TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 4
004460  001404                          BEQ     4$
004462  005005                          CLR     R5                      ;(R5)=EXPECTED DATA IN
                                                                        ;BUFFER ACTIVE REGISTER, 0
004464  017704  011036                  MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
                                                                        ;BUFFER ACTIVE REGISTER
004470                                  HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
004470  104000                          EMT     0
004472  022777  000001  011022  4$:     CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
004500  001405                          BEQ     5$
004502  017704  011014                  MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
                                                                        ;OF BUS ADDRESS MEMORY FOR
                                                                        ;LINE 4
004506  012705  000001                  MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
                                                                        ;BUS ADDRESS MEMORY FOR
                                                                        ;LINE 4, 1
004512                                  HLT     3                       ;BUS ADDRESS NOT UPDATED
004512  104003                          EMT     3
                                                                        ;CORRECTLY, ERROR
004514  005777  011004          5$:     TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
004520  001416                          BEQ     6$
004522  017704  010776                  MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
                                                                        ;COUNT FOR LINE 4
004526  005005                          CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
                                                                        ;COUNT FOR LINE 4, 0
004530                                  HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
004530  104004                          EMT     4
004532  016777  011002  010776          MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
004540  005077  010774                  CLR     @DHRLVL
004544  016777  010774  010770          MOV     DHTLVL,@DHTVEC
004552  005077  010766                  CLR     @DHTLVL
004556  012706  017270          6$:     MOV     #STACK,SP               ;RESTORE STACK
004562  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
        000005                          LINE=LINE+1
        000040                  BITX=BITX+BITX
004564                          NPRTS   \LINE,\BITX

                                ;NPR LOGIC TEST
                                ;SET BYTE COUNT TO 1 FOR LINE 5
                                ;SET BAR BIT FOR LINE 5
```

```
                                        ;DELAY FOR NPR
                                        ;VERIFY THAT BAR BIT FOR LINE 5 CLEARS
                                        ;VERIFY THAT TRANSMITTER DONE IS SET

 004564                         TS \XN,20,6$
 004564  012767  000340  173204 T15:    MOV     #340,PS         ;DISABLE ALL INTERRUPTS
 004572  012767  000020  010762         MOV     #20,ICOUNT      ;SET UP FOR 20 ITERATIONS
 004600  012767  005014  010750         MOV     #6$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1        ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
         000016                 XN=XN+1
 004606  012777  004000  010700         MOV     #BIT11,@DHSCR   ;ISSUE MASTER CLEAR
 004614  004767  010602                 JSR     PC,CLEAR        ;CLEAR ALL BUS ADDRESS
                                                                 ;AND BYTE COUNT MEMORY LOCATIONS
 004620  012777  004702  010714         MOV     #2$,@DHTVEC     ;SET UP TRANSMITTER
 004626  012777  000340  010710         MOV     #340,@DHTLVL    ;INTERRUPT VECTOR
 004634  012777  000005  010652         MOV     #5,@DHSCR       ;SELECT LINE 5
 004642  012777  177777  010654         MOV     #-1,@DHBC       ;SET BYTE COUNT TO 1
 004650  012700  001000                 MOV     #1000,R0
 004654  012777  000040  010644         MOV     #40,@DHBAR      ;SET BAR BIT FOR
                                                                 ;LINE 5
 004662  052777  020000  010624         BIS     #BIT13,@DHSCR   ;SET TRANSMITTER INTERRUPT ENABLE
 004670  005067  173102                 CLR     PS              ;ALLOW INTERRUPTS
 004674  005300          1$:    DEC     R0              ;DELAY FOR NPR
 004676  001376                 BNE     1$
 004700                         HLT     1               ;NO INTERRUPT OCCURED, ERROR
 004700  104001                 EMT     1
 004702  005777  010606  2$:    TST     @DHSCR          ;VERIFY THAT TRANSMITTER
                                                         ;DONE IS SET
 004706  100401                 BMI     3$
 004710                         HLT     2               ;TRANSMITTER DONE NOT SET, ERROR
 004710  104002                 EMT     2
 004712  005777  010610  3$:    TST     @DHBAR      ;WAS BAR BIT CLEARED FOR LINE 5
 004716  001404                 BEQ     4$
 004720  005005                 CLR     R5              ;(R5)=EXPECTED DATA IN
                                                         ;BUFFER ACTIVE REGISTER, 0
 004722  017704  010600         MOV     @DHBAR,R4       ;(R4)=ACTUAL CONTENTS OF
                                                         ;BUFFER ACTIVE REGISTER
 004726                         HLT     0               ;BUS ACTIVE BIT NOT CLEARED, ERROR
 004726  104000                 EMT     0
 004730  022777  000001  010564 4$:    CMP     #1,@DHBA        ;WAS BUS ADDRESS INCREMENTED
 004736  001405                 BEQ     5$
 004740  017704  010556         MOV     @DHBA,R4        ;(R4)=ACTUAL CONTENTS
                                                         ;OF BUS ADDRESS MEMORY FOR
                                                         ;LINE 5
 004744  012705  000001         MOV     #1,R5           ;(R5)=EXPECTED VALUE OF
                                                         ;BUS ADDRESS MEMORY FOR
                                                         ;LINE 5, 1
 004750                         HLT     3               ;BUS ADDRESS NOT UPDATED
 004750  104003                 EMT     3
                                                         ;CORRECTLY, ERROR
 004752  005777  010546  5$:    TST     @DHBC           ;DID BYTE COUNT DECREMENT TO 0
 004756  001416                 BEQ     6$
 004760  017704  010540         MOV     @DHBC,R4        ;(R4)=ACTUAL VALUE OF BYTE
                                                         ;COUNT FOR LINE 5
 004764  005005                 CLR     R5              ;(R5)=EXPECTED VALUE OF BYTE
```

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004766                                                  ;COUNT FOR LINE 5, 0
004766  104004                 EMT     4              ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
004770  016777  010544  010540 MOV     DHRLVL,@DHRVEC ;RESTORE TRAPCATCHER
004776  005077  010536         CLR     @DHRLVL
005002  016777  010536  010532 MOV     DHTLVL,@DHTVEC
005010  005077  010530         CLR     @DHTLVL
005014  012706  017270  6$:    MOV     #STACK,SP      ;RESTORE STACK
005020  104400                 SCOPE                  ;CHECK FOR ITERATIONS, LOOP
        000006                 LINE=LINE+1
        000100         BITX=BITX+BITX
005022                 NPRTS   \LINE,\BITX

                       ;NPR LOGIC TEST
                       ;SET BYTE COUNT TO 1 FOR LINE 6
                       ;SET BAR BIT FOR LINE 6
                       ;DELAY FOR NPR
                       ;VERIFY THAT BAR BIT FOR LINE 6 CLEARS
                       ;VERIFY THAT TRANSMITTER DONE IS SET

005022                 TS \XN,20,6$
005022  012767  000340  172746 T16:    MOV     #340,PS        ;DISABLE ALL INTERRUPTS
005030  012767  000020  010524         MOV     #2C,ICOUNT     ;SET UP FOR 20 ITERATIONS
005036  012767  005252  010512         MOV     #6$,ESCAPE     ;SET UP TO ESCAPE TO NEXT TEST
                       .IF NB  <>
                               MOV     #,FREEZ1       ;SET UP TO LOOP WITH DATA       : 3
                       .ENDC
        000017         XN=XN+1
005044  012777  004000  010442         MOV     #BIT11,@DHSCR  ;ISSUE MASTER CLEAR
005052  004767  010344         JSR     PC,CLEAR       ;CLEAR ALL BUS ADDRESS
                                                       ;AND BYTE COUNT MEMORY LOCATIONS
005056  012777  005140  010456         MOV     #2$,@DHTVEC    ;SET UP TRANSMITTER
005064  012777  000340  010452         MOV     #340,@DHTLVL   ;INTERRUPT VECTOR
005072  012777  000006  010414         MOV     #6,@DHSCR      ;SELECT LINE 6
005100  012777  177777  010416         MOV     #-1,@DHBC      ;SET BYTE COUNT TO 1
005106  012700  001000                 MOV     #1000,R0
005112  012777  000100  010406         MOV     #100,@DHBAR    ;SET BAR BIT FOR
                                                       ;LINE 6
005120  052777  020000  010366         BIS     #BIT13,@DHSCR  ;SET TRANSMITTER INTERRUPT ENABLE
005126  005067  172644                 CLR     PS             ;ALLOW INTERRUPTS
005132  005300         1$:     DEC     R0             ;DELAY FOR NPR
005134  001376                 BNE     1$
005136                         HLT     1              ;NO INTERRUPT OCCURED, ERROR
005136  104001                 EMT     1
005140  005777  010350  2$:    TST     @DHSCR         ;VERIFY THAT TRANSMITTER
                                                       ;DONE IS SET
005144  100401                 BMI     3$
005146                         HLT     2              ;TRANSMITTER DONE NOT SET, ERPOR
005146  104002                 EMT     2
005150  005777  010352  3$:    TST     @DHBAR     ;WAS BAR BIT CLEARED FOR LINE 6
005154  001404                 BEQ     4$
005156  005005                 CLR     R5             ;(R5)=EXPECTED DATA IN
                                                       ;BUFFER ACTIVE REGISTER, 0
005160  017704  010342         MOV     @DHBAR,R4      ;(R4)=ACTUAL CONTENTS OF
                                                       ;BUFFER ACTIVE REGISTER
005164                         HLT     0              ;BUS ACTIVE BIT NOT CLEARED, ERROR
005164  104000                 EMT     0
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005166  022777  000001  010326  4$:     CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
005174  001405                          BEQ     5$
005176  017704  010320                  MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
                                                                        ;OF BUS ADDRESS MEMORY FOR
                                                                        ;LINE 6
005202  012705  000001                  MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
                                                                        ;BUS ADDRESS MEMORY FOR
                                                                        ;LINE 6, 1
005206                                  HLT     3                       ;BUS ADDRESS NOT UPDATED
005206  104003                          EMT     3
                                                                        ;CORRECTLY, ERROR
005210  005777  010310          5$:     TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
005214  001416                          BEQ     6$
005216  017704  010302                  MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
                                                                        ;COUNT FOR LINE 6
005222  005005                          CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
                                                                        ;COUNT FOR LINE 6, 0
005224                                  HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
005224  104004                          EMT     4
005226  016777  010306  010302          MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
005234  005077  010300                  CLR     @DHRLVL
005240  016777  010300  010274          MOV     DHTLVL,@DHTVEC
005246  005077  010272                  CLR     @DHTLVL
005252  012706  017270          6$:     MOV     #STACK,SP               ;RESTORE STACK
005256  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
        000007                          LINE=LINE+1
        000200                  BITX=BITX+BITX
005260                          NPRTS   \LINE,\BITX

                                        ;NPR LOGIC TEST
                                        ;SET BYTE COUNT TO 1 FOR LINE 7
                                        ;SET BAR BIT FOR LINE 7
                                        ;DELAY FOR NPR
                                        ;VERIFY THAT BAR BIT FOR LINE 7 CLEARS
                                        ;VERIFY THAT TRANSMITTER DONE IS SET

005260                          TS \XN,20,6$
005260  012767  000340  172510  T17:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
005266  012767  000020  010266          MOV     #20,ICOUNT              ;SET UP FOR 20 ITERATIONS
005274  012767  005510  010254          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                        .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                        .ENDC
        000020          XN=XN+1
005302  012777  004000  010204          MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
005310  004767  010106                  JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
                                                                        ;AND BYTE COUNT MEMORY LOCATIONS
005314  012777  005376  010220          MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
005322  012777  000340  010214          MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
005330  012777  000007  010156          MOV     #7,@DHSCR               ;SELECT LINE 7
005336  012777  177777  010160          MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
005344  012700  001000                  MOV     #1000,R0
005350  012777  000200  010150          MOV     #200,@DHBAR             ;SET BAR BIT FOR
                                                                        ;LINE 7
005356  052777  020000  010130          BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
005364  005067  172406                  CLR     PS                      ;ALLOW INTERRUPTS
005370  005300                  1$:     DEC     R0                      ;DELAY FOR NPR
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005372  001376                          BNE     1$
005374                                  HLT     1                       ;NO INTERRUPT OCCURED, ERROR
005374  104001                          EMT     1
005376  005777  010112          2$:     TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
                                                                        ;DONE IS SET
005402  100401                          BMI     3$
005404                                  HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
005404  104002                          EMT     2
005406  005777  010114          3$:     TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 7
005412  001404                          BEQ     4$
005414  005005                          CLR     R5                      ;(R5)=EXPECTED DATA IN
                                                                        ;BUFFER ACTIVE REGISTER, 0
005416  017704  010104                  MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
                                                                        ;BUFFER ACTIVE REGISTER
005422                                  HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
005422  104000                          EMT     0
005424  022777  000001  010070  4$:     CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
005432  001405                          BEQ     5$
005434  017704  010062                  MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
                                                                        ;OF BUS ADDRESS MEMORY FOR
                                                                        ;LINE 7
005440  012705  000001                  MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
                                                                        ;BUS ADDRESS MEMORY FOR
                                                                        ;LINE 7, 1
005444                                  HLT     3                       ;BUS ADDRESS NOT UPDATED
005444  104003                          EMT     3
                                                                        ;CORRECTLY, ERROR
005446  005777  010052          5$:     TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
005452  001416                          BEQ     6$
005454  017704  010044                  MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
                                                                        ;COUNT FOR LINE 7
005460  005005                          CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
                                                                        ;COUNT FOR LINE 7, 0
005462                                  HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
005462  104004                          EMT     4
005464  016777  010050  010044          MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
005472  005077  010042                  CLR     @DHRLVL
005476  016777  010042  010036          MOV     DHTLVL,@DHTVEC
005504  005077  010034                  CLR     @DHTLVL
005510  012706  017270          6$:     MOV     #STACK,SP               ;RESTORE STACK
005514  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
        000010                          LINE=LINE+1
        000400                  BITX=BITX+BITX
005516                          NPRTS   \LINE,\BITX

                                        ;NPR LOGIC TEST
                                        ;SET BYTE COUNT TO 1 FOR LINE 10
                                        ;SET BAR BIT FOR LINE 10
                                        ;DELAY FOR NPR
                                        ;VERIFY THAT BAR BIT FOR LINE 10 CLEARS
                                        ;VERIFY THAT TRANSMITTER DONE IS SET

005516                          TS \XN,20,6$
005516  012767  000340  172252  T20:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
005524  012767  000020  010030          MOV     #20,ICOUNT              ;SET UP FOR 20 ITERATIONS
005532  012767  005746  010016          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
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                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA          ; 3
                                .ENDC
        000021                  XN=XN+1
005540  012777  004000  007746        MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
005546  004767  007650                JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
                                                                      ;AND BYTE COUNT MEMORY LOCATIONS
005552  012777  005634  007762        MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
005560  012777  000340  007756        MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
005566  012777  000010  007720        MOV     #10,@DHSCR              ;SELECT LINE 10
005574  012777  177777  007722        MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
005602  012700  001000                MOV     #1000,R0
005606  012777  000400  007712        MOV     #400,@DHBAR             ;SET BAR BIT FOR
                                                                      ;LINE 10
005614  052777  020000  007672        BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
005622  005067  172150                CLR     PS                      ;ALLOW INTERRUPTS
005626  005300                1$:     DEC     R0                      ;DELAY FOR NPR
005630  001376                        BNE     1$
005632                                HLT     1                       ;NO INTERRUPT OCCURED, ERROR
005632  104001                        EMT     1
005634  005777  007654        2$:     TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
                                                                      ;DONE IS SET
005640  100401                        BMI     3$
005642                                HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
005642  104002                        EMT     2
005644  005777  007656        3$:     TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 10
005650  001404                        BEQ     4$
005652  005005                        CLR     R5                      ;(R5)=EXPECTED DATA IN
                                                                      ;BUFFER ACTIVE REGISTER, 0
005654  017704  007646                MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
                                                                      ;BUFFER ACTIVE REGISTER
005660                                HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
005660  104000                        EMT     0
005662  022777  000001  007632  4$:   CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
005670  001405                        BEQ     5$
005672  017704  007624                MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
                                                                      ;OF BUS ADDRESS MEMORY FOR
                                                                      ;LINE 10
005676  012705  000001                MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
                                                                      ;BUS ADDRESS MEMORY FOR
                                                                      ;LINE 10, 1
005702                                HLT     3                       ;BUS ADDRESS NOT UPDATED
005702  104003                        EMT     3
                                                                      ;CORRECTLY, ERROR
005704  005777  007614        5$:     TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
005710  001416                        BEQ     6$
005712  017704  007606                MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
                                                                      ;COUNT FOR LINE 10
005716  005005                        CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
                                                                      ;COUNT FOR LINE 10, 0
005720                                HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
005720  104004                        EMT     4
005722  016777  007612  007606        MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
005730  005077  007604                CLR     @DHRLVL
005734  016777  007604  007600        MOV     DHTLVL,@DHTVEC
005742  005077  007576                CLR     @DHTLVL
005746  012706  017270        6$:     MOV     #STACK,SP               ;RESTORE STACK
005752  104400                        SCOPE                           ;CHECK FOR ITERATIONS, LOOP
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                000011                          LINE=LINE+1
                001000                  BITX=BITX+BITX
        005754                          NPRTS   \LINE,\BITX

                                                ;NPR LOGIC TEST
                                                ;SET BYTE COUNT TO 1 FOR LINE 11
                                                ;SET BAR BIT FOR LINE 11
                                                ;DELAY FOR NPR
                                                ;VERIFY THAT BAR BIT FOR LINE 11 CLEARS
                                                ;VERIFY THAT TRANSMITTER DONE IS SET

        005754                          TS \XN,20,6$
        005754  012767  000340  172014  T21:    MOV     #340,PS         ;DISABLE ALL INTERRUPTS
        005762  012767  000020  007572          MOV     #20,ICOUNT      ;SET UP FOR 20 ITERATIONS
        005770  012767  006204  007560          MOV     #6$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
                                        .IF NB  <>
                                                MOV     #,FREEZ1        ;SET UP TO LOOP WITH DATA       ; 3
                                        .ENDC
                000022                  XN=XN+1
        005776  012777  004000  007510          MOV     #BIT11,@DHSCR   ;ISSUE MASTER CLEAR
        006004  004767  007412                  JSR     PC,CLEAR        ;CLEAR ALL BUS ADDRESS
                                                                        ;AND BYTE COUNT MEMORY LOCATIONS
        006010  012777  006072  007524          MOV     #2$,@DHTVEC     ;SET UP TRANSMITTER
        006016  012777  000340  007520          MOV     #340,@DHTLVL    ;INTERRUPT VECTOR
        006024  012777  000011  007462          MOV     #11,@DHSCR      ;SELECT LINE 11
        006032  012777  177777  007464          MOV     #-1,@DHBC       ;SET BYTE COUNT TO 1
        006040  012700  001000                  MOV     #1000,R0
        006044  012777  001000  007454          MOV     #1000,@DHBAR    ;SET BAR BIT FOR
                                                                        ;LINE 11
        006052  052777  020000  007434          BIS     #BIT13,@DHSCR   ;SET TRANSMITTER INTERRUPT ENABLE
        006060  005067  171712                  CLR     PS              ;ALLOW INTERRUPTS
        006064  005300                  1$:     DEC     R0              ;DELAY FOR NPR
        006066  001376                          BNE     1$
        006070                                  HLT     1               ;NO INTERRUPT OCCURED, ERROR
        006070  104001                          EMT     1
        006072  005777  007416          2$:     TST     @DHSCR          ;VERIFY THAT TRANSMITTER
                                                                        ;DONE IS SET
        006076  100401                          BMI     3$
        006100                                  HLT     2               ;TRANSMITTER DONE NOT SET, ERROR
        006100  104002                          EMT     2
        006102  005777  007420          3$:     TST     @DHBAR      ;WAS BAR BIT CLEARED FOR LINE 11
        006106  001404                          BEQ     4$
        006110  005005                          CLR     R5              ;(R5)=EXPECTED DATA IN
                                                                        ;BUFFER ACTIVE REGISTER, 0
        006112  017704  007410                  MOV     @DHBAR,R4       ;(R4)=ACTUAL CONTENTS OF
                                                                        ;BUFFER ACTIVE REGISTER
        006116                                  HLT     0               ;BUS ACTIVE BIT NOT CLEARED, ERROR
        006116  104000                          EMT     0
        006120  022777  000001  007374  4$:     CMP     #1,@DHBA        ;WAS BUS ADDRESS INCREMENTED
        006126  001405                          BEQ     5$
        006130  017704  007366                  MOV     @DHBA,R4        ;(R4)=ACTUAL CONTENTS
                                                                        ;OF BUS ADDRESS MEMORY FOR
                                                                        ;LINE 11
        006134  012705  000001                  MOV     #1,R5           ;(R5)=EXPECTED VALUE OF
                                                                        ;BUS ADDRESS MEMORY FOR
                                                                        ;LINE 11, 1
        006140                                  HLT     3               ;BUS ADDRESS NOT UPDATED
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006140  104003                          EMT     3
                                                                ;CORRECTLY, ERROR
006142  005777  007356          5$:     TST     @DHBC           ;DID BYTE COUNT DECREMENT TO 0
006146  001416                          BEQ     6$
006150  017704  007350                  MOV     @DHBC,R4        ;(R4)=ACTUAL VALUE OF BYTE
                                                                ;COUNT FOR LINE 11
006154  005005                          CLR     R5              ;(R5)=EXPECTED VALUE OF BYTE
                                                                ;COUNT FOR LINE 11, 0
006156                                  HLT     4               ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
006156  104004                          EMT     4
006160  016777  007354  007350          MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
006166  005077  007346                  CLR     @DHRLVL
006172  016777  007346  007342          MOV     DHTLVL,@DHT.EC
006200  005077  007340                  CLR     @DHTLVL
006204  012706  017270          6$:     MOV     #STACK,SP       ;RESTORE STACK
006210  104400                          SCOPE                   ;CHECK FOR ITERATIONS, LOOP
        000012                          LINE=LINE+1
        002000                  BITX=BITX+BITX
006212                          NPRTS   \LINE,\BITX

                                ;NPR LOGIC TEST
                                ;SET BYTE COUNT TO 1 FOR LINE 12
                                ;SET BAR BIT FOR LINE 12
                                ;DELAY FOR NPR
                                ;VERIFY THAT BAR BIT FOR LINE 12 CLEARS
                                ;VERIFY THAT TRANSMITTER DONE IS SET

006212                          TS \XN,20,6$
006212  012767  000340  171556  T22:     MOV     #340,PS         ;DISABLE ALL INTERRUPTS
006220  012767  000020  007334          MOV     #20,ICOUNT      ;SET UP FOR 20 ITERATIONS
006226  012767  006442  007322          MOV     #6$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1        ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000023                  XN=XN+1
006234  012777  004000  007252          MOV     #BIT11,@DHSCR   ;ISSUE MASTER CLEAR
006242  004767  007154                  JSR     PC,CLEAR        ;CLEAR ALL BUS ADDRESS
                                                                ;AND BYTE COUNT MEMORY LOCATIONS
006246  012777  006330  007266          MOV     #2$,@DH1VEC     ;SET UP TRANSMITTER
006254  012777  000340  007262          MOV     #340,@DHTLVL    ;INTERPUPT VECTOR
006262  012777  000012  007224          MOV     #12,@DHSCR      ;SELECT LINE 12
006270  012777  177777  007226          MOV     #-1,@DHBC       ;SET BYTE COUNT TO 1
006276  012700  001000                  MOV     #1000,R0
006302  012777  002000  007216          MOV     #2000,@DHBAR    ;SET BAR BIT FOR
                                                                ;LINE 12
006310  052777  020000  007176          BIS     #BIT13,@DHSCR   ;SET TRANSMITTER INTERRUPT ENABLE
006316  005067  171454                  CLR     PS              ;ALLOW INTERRUPTS
006322  005300          1$:     DEC     R0                      ;DELAY FOR NPR
006324  001376                  BNE     1$
006326                          HLT     1                       ;NO INTERRUPT OCCURED, ERROR
006326  104001                  EMT     1
006330  005777  007160          2$:     TST     @DHSCR          ;VERIFY THAT TRANSMITTER
                                                                ;DONE IS SET
006334  100401                  BMI     3$
006336                          HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
006336  104002                  EMT     2
006340  005777  007162          3$:     TST     @DHBAR      ;WAS BAR BIT CLEARED FOR LINE 12
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006344  001404                          BEQ     4$
006346  005005                          CLR     R5                      ;(R5)=EXPECTED DATA IN
                                                                        ;BUFFER ACTIVE REGISTER, 0
006350  017704  007152                  MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
                                                                        ;BUFFER ACTIVE REGISTER
006354                                  HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
006354  104000                          EMT     0
006356  022777  000001  007136  4$:     CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
006364  001405                          BEQ     5$
006366  017704  007130                  MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
                                                                        ;OF BUS ADDRESS MEMORY FOR
                                                                        ;LINE 12
006372  012705  000001                  MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
                                                                        ;BUS ADDRESS MEMORY FOR
                                                                        ;LINE 12, 1
006376                                  HLT     3                       ;BUS ADDRESS NOT UPDATED
006376  104003                          EMT     3
                                                                        ;CORRECTLY, ERROR
006400  005777  007120          5$:     TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
006404  001416                          BEQ     6$
006406  017704  007112                  MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
                                                                        ;COUNT FOR LINE 12
006412  005005                          CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
                                                                        ;COUNT FOR LINE 12, 0
006414                                  HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
006414  104004                          EMT     4
006416  016777  007116  007112          MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
006424  005077  007110                  CLR     @DHRLVL
006430  016777  007110  007104          MOV     DHTLVL,@DHTVEC
006436  005077  007102                  CLR     @DHTLVL
006442  012706  017270          6$:     MOV     #STACK,SP               ;RESTORE STACK
006446  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
        000013                          LINE=LINE+1
        004000                  BITX=BITX+BITX
006450                          NPRTS   \LINE,\BITX

                                        ;NPR LOGIC TEST
                                        ;SET BYTE COUNT TO 1 FOR LINE 13
                                        ;SET BAR BIT FOR LINE 13
                                        ;DELAY FOR NPR
                                        ;VERIFY THAT BAR BIT FOR LINE 13 CLEARS
                                        ;VERIFY THAT TRANSMITTER DONE IS SET

006450                          TS \XN,20,6$
006450  012767  000340  171320  T23:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
006456  012767  000020  007076          MOV     #20,ICOUNT              ;SET UP FOR 20 ITERATIONS
006464  012767  006700  007064          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000024                  XN=XN+1
006472  012777  004000  007014          MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
006500  004767  006716                  JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
                                                                        ;AND BYTE COUNT MEMORY LOCATIONS
006504  012777  006566  007030          MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
006512  012777  000340  007024          MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
006520  012777  000013  006766          MOV     #13,@DHSCR              ;SELECT LINE 13
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006526  012777  177777  006770          MOV     #-1,@CHBC               ;SET BYTE COUNT TO 1
006534  012700  001000                  MOV     #1000,R0
006540  012777  004000  006760          MOV     #4000,@DHBAR            ;SET BAR BIT FOR
                                                                        ;LINE 13
006546  052777  020000  006740          BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
006554  005067  171216                  CLR     PS                      ;ALLOW INTERRUPTS
006560  005300                  1$:     DEC     R0                      ;DELAY FOR NPR
006562  001376                  BNE     1$
006564                          HLT     1                               ;NO INTERRUPT OCCURED, ERROR
006564  104001                  EMT     1
006566  005777  006722          2$:     TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
                                                                        ;DONE IS SET
006572  100401                  BMI     3$
006574                          HLT     2                               ;TRANSMITTER DONE NOT SET, ERROR
006574  104002                  EMT     2
006576  005777  006724          3$:     TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 13
006602  001404                  BEQ     4$
006604  005005                  CLR     R5                              ;(R5)=EXPECTED DATA IN
                                                                        ;BUFFER ACTIVE REGISTER, 0
006606  017704  006714          MOV     @DHBAR,R4                       ;(R4)=ACTUAL CONTENTS OF
                                                                        ;BUFFER ACTIVE REGISTER
006612                          HLT     0                               ;BUS ACTIVE BIT NOT CLEARED, ERROR
006612  104000                  EMT     0
006614  022777  000001  006700  4$:     CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
006622  001405                  BEQ     5$
006624  017704  006672          MOV     @DHBA,R4                        ;(R4)=ACTUAL CONTENTS
                                                                        ;OF BUS ADDRESS MEMORY FOR
                                                                        ;LINE 13
006630  012705  000001          MOV     #1,R5                           ;(R5)=EXPECTED VALUE OF
                                                                        ;BUS ADDRESS MEMORY FOR
                                                                        ;LINE 13, 1
006634                          HLT     3                               ;BUS ADDRESS NOT UPDATED
006634  104003                  EMT     3
                                                                        ;CORRECTLY, ERROR
006636  005777  006662          5$:     TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
006642  001416                  BEQ     6$
006644  017704  006654          MOV     @DHBC,R4                        ;(R4)=ACTUAL VALUE OF BYTE
                                                                        ;COUNT FOR LINE 13
006650  005005                  CLR     R5                              ;(R5)=EXPECTED VALUE OF BYTE
                                                                        ;COUNT FOR LINE 13, 0
006652                          HLT     4                               ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
006652  104004                  EMT     4
006654  016777  006660  006654  MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
006662  005077  006652          CLR     @DHRLVL
006666  016777  006652  006646  MOV     DHTLVL,@DHTVEC
006674  005077  006644          CLR     @DHTLVL
006700  012706  017270          6$:     MOV     #STACK,SP               ;RESTORE STACK
006704  104400                  SCOPE                                   ;CHECK FOR ITERATIONS, LOOP
        000014                  LINE=LINE+1
        010000          BITX=BITX+BITX
006706                  NPRTS   \LINE,\BITX

                                ;NPR LOGIC TEST
                                ;SET BYTE COUNT TO 1 FOR LINE 14
                                ;SET BAR BIT FOR LINE 14
                                ;DELAY FOR NPR
                                ;VERIFY THAT BAR BIT FOR LINE 14 CLEARS
```

```
                                        ;VERIFY THAT TRANSMITTER DONE IS SET

006706                          TS \XN,20,6$
006706  012767  000340  171062  T24:    MOV     #340,PS         ;DISABLE ALL INTERRUPTS
006714  012767  000020  006640          MOV     #20,ICOUNT      ;SET UP FOR 20 ITERATIONS
006722  012767  007136  006626          MOV     #6$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1        ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000025                  XN=XN+1
006730  012777  004000  006556          MOV     #BIT11,@DHSCR   ;ISSUE MASTER CLEAR
006736  004767  006460                  JSR     PC,CLEAR        ;CLEAR ALL BUS ADDRESS
                                                                ;AND BYTE COUNT MEMORY LOCATIONS
006742  012777  007024  006572          MOV     #2$,@DHTVEC     ;SET UP TRANSMITTER
006750  012777  000340  006566          MOV     #340,@DHTLVL    ;INTERRUPT VECTOR
006756  012777  000014  006530          MOV     #14,@DHSCR      ;SELECT LINE 14
006764  012777  177777  006532          MOV     #-1,@DHBC       ;SET BYTE COUNT TO 1
006772  012700  001000                  MOV     #1000,R0
006776  012777  010000  006522          MOV     #10000,@DHBAR   ;SET BAR BIT FOR
                                                                ;LINE 14
007004  052777  020000  006502          BIS     #BIT13,@DHSCR   ;SET TRANSMITTER INTERRUPT ENABLE
007012  005067  170760                  CLR     PS              ;ALLOW INTERRUPTS
007016  005300                  1$:     DEC     R0              ;DELAY FOR NPR
007020  001376                          BNE     1$
007022                                  HLT     1               ;NO INTERRUPT OCCURED, ERROR
007022  104001                          EMT     1
007024  005777  006464          2$:     TST     @DHSCR          ;VERIFY THAT TRANSMITTER
                                                                ;DONE IS SET
007030  100401                          BMI     3$
007032                                  HLT     2               ;TRANSMITTER DONE NOT SET, ERROR
007032  104002                          EMT     2
007034  005777  006466          3$:     TST     @DHBAR      ;WAS BAR BIT CLEARED FOR LINE 14
007040  001404                          BEQ     4$
007042  005005                          CLR     R5              ;(R5)=EXPECTED DATA IN
                                                                ;BUFFER ACTIVE REGISTER, 0
007044  017704  006456                  MOV     @DHBAR,R4       ;(R4)=ACTUAL CONTENTS OF
                                                                ;BUFFER ACTIVE REGISTER
007050                                  HLT     0               ;BUS ACTIVE BIT NOT CLEARED, ERROR
007050  104000                          EMT     0
007052  022777  000001  006442  4$:     CMP     #1,@DHBA        ;WAS BUS ADDRESS INCREMENTED
007060  001405                          BEQ     5$
007062  017704  006434                  MOV     @DHBA,R4        ;(R4)=ACTUAL CONTENTS
                                                                ;OF BUS ADDRESS MEMORY FOR
                                                                ;LINE 14
007066  012705  000001                  MOV     #1,R5           ;(R5)=EXPECTED VALUE OF
                                                                ;BUS ADDRESS MEMORY FOR
                                                                ;LINE 14, 1
007072                                  HLT     3               ;BUS ADDRESS NOT UPDATED
007072  104003                          EMT     3
                                                                ;CORRECTLY, ERROR
007074  005777  006424          5$:     TST     @DHBC           ;DID BYTE COUNT DECREMENT TO 0
007100  001416                          BEQ     6$
007102  017704  006416                  MOV     @DHBC,R4        ;(R4)=ACTUAL VALUE OF BYTE
                                                                ;COUNT FOR LINE 14
007106  005005                          CLR     R5              ;(R5)=EXPECTED VALUE OF BYTE
                                                                ;COUNT FOR LINE 14, 0
007110                                  HLT     4               ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
```

```
007110  104004                          EMT     4
007112  016777  006422  006416          MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
007120  005077  006414                  CLR     @DHRLVL
007124  016777  006414  006410          MOV     DHTLVL,@DHTVEC
007132  005077  006406                  CLR     @DHTLVL
007136  012706  017270          6$:     MOV     #STACK,SP               ;RESTORE STACK
007142  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
        000015                          LINE=LINE+1
        020000                  BITX=BITX+BITX
007144                          NPRTS   \LINE,\BITX

                                ;NPR LOGIC TEST
                                ;SET BYTE COUNT TO 1 FOR LINE 15
                                ;SET BAR BIT FOR LINE 15
                                ;DELAY FOR NPR
                                ;VERIFY THAT BAR BIT FOR LINE 15 CLEARS
                                ;VERIFY THAT TRANSMITTER DONE IS SET

007144                          TS \XN,20,6$
007144  012767  000340  170624  T25:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
007152  012767  000020  006402          MOV     #20,ICOUNT              ;SET UP FOR 20 ITERATIONS
007160  012767  007374  006370          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NE  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000026                  XN=XN+1
007166  012777  004000  006320          MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
007174  004767  006222                  JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
                                                                        ;AND BYTE COUNT MEMORY LOCATIONS
007200  012777  007262  006334          MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
007206  012777  000340  006330          MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
007214  012777  000015  006272          MOV     #15,@DHSCR              ;SELECT LINE 15
007222  012777  177777  006274          MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
007230  012700  001000                  MOV     #1000,R0
007234  012777  020000  006264          MOV     #20000,@DHBAR           ;SET BAR BIT FOR
                                                                        ;LINE 15
007242  052777  020000  006244          BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
007250  005067  170522                  CLR     PS                      ;ALLOW INTERRUPTS
007254  005300                  1$:     DEC     R0                      ;DELAY FOR NPR
007256  001376                          BNE     1$
007260                                  HLT     1                       ;NO INTERRUPT OCCURED, ERROR
007260  104001                          EMT     1
007262  005777  006226          2$:     TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
                                                                        ;DONE IS SET
007266  100401                          BMI     3$
007270                                  HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
007270  104002                          EMT     2
007272  005777  006230          3$:     TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 15
007276  001404                          BEQ     4$
007300  005005                          CLR     R5                      ;(R5)=EXPECTED DATA IN
                                                                        ;BUFFER ACTIVE REGISTER, 0
007302  017704  006220                  MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
                                                                        ;BUFFER ACTIVE REGISTER
007306                                  HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
007306  104000                          EMT     0
007310  022777  000001  006204  4$:     CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
007316  001405                          BEQ     5$
```

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007320  017704  006176          MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
                                                                ;OF BUS ADDRESS MEMORY FOR
                                                                ;LINE 15
007324  012705  000001          MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
                                                                ;BUS ADDRESS MEMORY FOR
                                                                ;LINE 15, 1
007330                          HLT     3                       ;BUS ADDRESS NOT UPDATED
007330  104003                  EMT     3
                                                                ;CORRECTLY, ERROR
007332  005777  006166    5$:   TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
007336  001416                  BEQ     6$
007340  017704  006160          MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
                                                                ;COUNT FOR LINE 15
007344  005005                  CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
                                                                ;COUNT FOR LINE 15, 0
007346                          HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
007346  104004                  EMT     4
007350  016777  006164  006160  MOV     DHRLVL,@DHRVEC  ,RESTORE TRAPCATCHER
007356  005077  006156          CLR     @DHRLVL
007362  016777  006156  006152  MOV     DHTLVL,@DHTVEC
007370  005077  006150          CLR     @DHTLVL
007374  012706  017270    6$:   MOV     #STACK,SP               ;RESTORE STACK
007400  104400                  SCOPE                           ;CHECK FOR ITERATIONS, LOOP
        000016                  LINE=LINE+1
        040000          BITX=BITX+BITX
007402                  NPRTS   \LINE,\BITX

                                ;NPR LOGIC TEST
                                ;SET BYTE COUNT TO 1 FOR LINE 16
                                ;SET BAR BIT FOR LINE 16
                                ;DELAY FOR NPR
                                ;VERIFY THAT BAR BIT FOR LINE 16 CLEARS
                                ;VERIFY THAT TRANSMITTER DONE IS SET

007402                  TS \XN,20,6$
007402  012767  000340  170366  T26:   MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
007410  012767  000020  006144          MOV     #20,ICOUNT              ;SET UP FOR 20 ITERATIONS
007416  012767  007632  006132          MOV     #6$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                        .IF NB  <>
                                MOV     #.,FREEZ1               ;SET UP TO LOOP WITH DATA       ; 3
                        .ENDC
        000027          XN=XN+1
007424  012777  004000  006062          MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
007432  004767  005764                  JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
                                                                        ;AND BYTE COUNT MEMORY LOCATIONS
007436  012777  007520  006076          MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
007444  012777  000340  006072          MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
007452  012777  000016  006034          MOV     #16,@DHSCR              ;SELECT LINE 16
007460  012777  177777  006036          MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
007466  012700  001000                  MOV     #1000,R0
007472  012777  040000  006026          MOV     #40000,@DHBAR           ;SET BAR BIT FOR
                                                                        ;LINE 16
007500  052777  020000  006006          BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
007506  005067  170264                  CLR     PS                      ;ALLOW INTERRUPTS
007512  005300                  1$:     DEC     R0                      ;DELAY FOR NPR
007514  001376                  BNE     1$
007516                          HLT     1                       ;NO INTERRUPT OCCURED, ERROR
```

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007516  104001                          EMT     1
007520  005777  005770          2$:     TST     @DHSCR          ;VERIFY THAT TRANSMITTER
                                                                ;DONE IS SET
007524  100401                          BMI     3$
007526                                  HLT     2               ;TRANSMITTER DONE NOT SET, ERROR
007526  104002                          EMT     2
007530  005777  005772          3$:     TST     @DHBAR      ;WAS BAR BIT CLEARED FOR LINE 16
007534  001404                          BEQ     4$
007536  005005                          CLR     R5              ;(R5)=EXPECTED DATA IN
                                                                ;BUFFER ACTIVE REGISTER, 0
007540  017704  005762                  MOV     @DHBAR,R4       ;(R4)=ACTUAL CONTENTS OF
                                                                ;BUFFER ACTIVE REGISTER
007544                                  HLT     0               ;BUS ACTIVE BIT NOT CLEARED, ERROR
007544  104000                          EMT     0
007546  022777  000001  005746  4$:     CMP     #1,@DHBA        ;WAS BUS ADDRESS INCREMENTED
007554  001405                          BEQ     5$
007556  017704  005740                  MOV     @DHBA,R4        ;(R4)=ACTUAL CONTENTS
                                                                ;OF BUS ADDRESS MEMORY FOR
                                                                ;LINE 16
007562  012705  000001                  MOV     #1,R5           ;(R5)=EXPECTED VALUE OF
                                                                ;BUS ADDRESS MEMORY FOR
                                                                ;LINE 16, 1
007566                                  HLT     3               ;BUS ADDRESS NOT UPDATED
007566  104003                          EMT     3

                                                                ;CORRECTLY, ERROR
007570  005777  005730          5$:     TST     @DHBC           ;DID BYTE COUNT DECREMENT TO 0
007574  001416                          BEQ     6$
007576  017704  005722                  MOV     @DHBC,R4        ;(R4)=ACTUAL VALUE OF BYTE
                                                                ;COUNT FOR LINE 16
007602  005005                          CLR     R5              ;(R5)=EXPECTED VALUE OF BYTE
                                                                ;COUNT FOR LINE 16, 0
007604                                  HLT     4               ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
007604  104004                          EMT     4
007606  016777  005726  005722          MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
007614  005077  005720                  CLR     @DHRLVL
007620  016777  005720  005714          MOV     DHTLVL,@DHTVEC
007626  005077  005712                  CLR     @DHTLVL
007632  012706  017270          6$:     MOV     #STACK,SP       ;RESTORE STACK
007636  104400                          SCOPE                   ;CHECK FOR ITERATIONS, LOOP
        000017                          LINE=LINE+1
        100000                  BITX=BITX+BITX
007640                          NPRTS   \LINE,\BITX

                                        ;NPR LOGIC TEST
                                        ;SET BYTE COUNT TO 1 FOR LINE 17
                                        ;SET BAR BIT FOR LINE 17
                                        ;DELAY FOR NPR
                                        ;VERIFY THAT BAR BIT FOR LINE 17 CLEARS
                                        ;VERIFY THAT TRANSMITTER DONE IS SET

007640                          TS \XN,20,6$
007640  012767  000340  170130  T27:     MOV     #340,PS         ;DISABLE ALL INTERRUPTS
007646  012767  000020  005706          MOV     #20,ICOUNT      ;SET UP FOR 20 ITERATIONS
007654  012767  010070  005674          MOV     #6$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1        ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
```

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                000030                  XN=XN+1
007662  012777  004000  005624          MOV     #BIT11,@DHSCR           ;ISSUE MASTER CLEAR
007670  004767  005526                  JSR     PC,CLEAR                ;CLEAR ALL BUS ADDRESS
                                                                        ;AND BYTE COUNT MEMORY LOCATIONS
007674  012777  007756  005640          MOV     #2$,@DHTVEC             ;SET UP TRANSMITTER
007702  012777  000340  005634          MOV     #340,@DHTLVL            ;INTERRUPT VECTOR
007710  012777  000017  005576          MOV     #17,@DHSCR              ;SELECT LINE 17
007716  012777  177777  005600          MOV     #-1,@DHBC               ;SET BYTE COUNT TO 1
007724  012700  001000                  MOV     #1000,R0
007730  012777  100000  005570          MOV     #100000,@DHBAR          ;SET BAR BIT FOR
                                                                        ;LINE 17
007736  052777  020000  005550          BIS     #BIT13,@DHSCR           ;SET TRANSMITTER INTERRUPT ENABLE
007744  005067  170026                  CLR     PS                      ;ALLOW INTERRUPTS
007750  005300          1$:             DEC     R0                      ;DELAY FOR NPR
007752  001376                          BNE     1$
007754                                  HLT     1                       ;NO INTERRUPT OCCURED, ERROR
007754  104001                          EMT     1
007756  005777  005532          2$:     TST     @DHSCR                  ;VERIFY THAT TRANSMITTER
                                                                        ;DONE IS SET
007762  100401                          BMI     3$
007764                                  HLT     2                       ;TRANSMITTER DONE NOT SET, ERROR
007764  104002                          EMT     2
007766  005777  005534          3$:     TST     @DHBAR          ;WAS BAR BIT CLEARED FOR LINE 17
007772  001404                          BEQ     4$
007774  005005                          CLR     R5                      ;(R5)=EXPECTED DATA IN
                                                                        ;BUFFER ACTIVE REGISTER, 0
007776  017704  005524                  MOV     @DHBAR,R4               ;(R4)=ACTUAL CONTENTS OF
                                                                        ;BUFFER ACTIVE REGISTER
010002                                  HLT     0                       ;BUS ACTIVE BIT NOT CLEARED, ERROR
010002  104000                          EMT     0
010004  022777  000001  005510  4$:     CMP     #1,@DHBA                ;WAS BUS ADDRESS INCREMENTED
010012  001405                          BEQ     5$
010014  017704  005502                  MOV     @DHBA,R4                ;(R4)=ACTUAL CONTENTS
                                                                        ;OF BUS ADDRESS MEMORY FOR
                                                                        ;LINE 17
010020  012705  000001                  MOV     #1,R5                   ;(R5)=EXPECTED VALUE OF
                                                                        ;BUS ADDRESS MEMORY FOR
                                                                        ;LINE 17, 1
010024                                  HLT     3                       ;BUS ADDRESS NOT UPDATED
010024  104003                          EMT     3
                                                                        ;CORRECTLY, ERROR
010026  005777  005472          5$:     TST     @DHBC                   ;DID BYTE COUNT DECREMENT TO 0
010032  001416                          BEQ     6$
010034  017704  005464                  MOV     @DHBC,R4                ;(R4)=ACTUAL VALUE OF BYTE
                                                                        ;COUNT FOR LINE 17
010040  005005                          CLR     R5                      ;(R5)=EXPECTED VALUE OF BYTE
                                                                        ;COUNT FOR LINE 17, 0
010042                                  HLT     4                       ;BYTE COUNT DID NOT DECREMENT TO 0, ERROR
010042  104004                          EMT     4
010044  016777  005470  005464          MOV     DHRLVL,@DHRVEC  ;RESTORE TRAPCATCHER
010052  005077  005462                  CLR     @DHRLVL
010056  016777  005462  005456          MOV     DHTLVL,@DHTVEC
010064  005077  005454                  CLR     @DHTLVL
010070  012706  017270          6$:     MOV     #STACK,SP               ;RESTORE STACK
010074  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
                000020                  LINE=LINE+1
                000000          BITX=BITX+BITX
```

```
                        LINE=0
                        XLINE=LINE
                        BITX=1
                        XBIT=BITX
                        .REPT   20
                        NPRTS2  \LINE,\BITX
                        .NLIST
                                LINE=LINE+1
                        BITX=BITX+BITX
                        .LIST
                        .ENDR
010076                  NPRTS2  \LINE,\BITX

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

010076                  TS \XN,10,8$
010076  012767  000340  167672 T30:    MOV     #340,PS         ;DISABLE ALL INTERRUPTS
010104  012767  000010  005450        MOV     #10,ICOUNT      ;SET UP FOR 10 ITERATIONS
010112  012767  010244  005436        MOV     #8$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
                        .IF NB  <>
                                MOV     #.FREEZ1        ;SET UP TO LOOP WITH DATA       ; 3
                        .ENDC
        000031          XN=XN+1
010120  012777  004000  005366        MOV     #BIT11,@DHSCR   ;MASTER CLEAR INTERFACE
                                                        ;TO SET ALL TBMT BITS
010126  004767  005270                JSR     PC,CLEAR        ;CLEAR ALL BYTE COUNT AND
                                                        ;BUS ADDRESS MEMORY LOCATIONS
010132  004767  005316                JSR     PC,LOAD         ;SET ALL BYTE COUNT LOCATIONS TO -1
010136  012777  000001  005362        MOV     #1,@DHBAR       ;SET BAR BIT FOR LINE 0
010144  005777  005344        3$:     TST     @DHSCR          ;WAIT FOR TRANSMITTER DONE
010150  100375                BPL     3$
010152  012700  000020        MOV     #20,R0          ;SET UP TO CHECK ALL 16 LINES
010156  005077  005332        CLR     @DHSCR          ;START AT LINE 0
010162  005001                CLR     R1              ;KEEP TRACK OF LINE NUMBER
010164  012705  177777        4$:     MOV     #-1,R5          ;(R5)=EXPECTED BYTE COUNT,
                                                        ;IF LINE NUMBER NOT = 0
010170  005003                CLR     R3              ;(R3)=EXPECTED BUS ADDRESS,
                                                        ;IF LINE NUMBER NOT = 0
010172  017704  005326        MOV     @DHBC,R4        ;(R4)=ACTUAL BYTE ACOUNT
010176  017702  005320        MOV     @DHBA,R2        ;(R5)=ACTUAL BUS ADDRESS
010202  027727  005306  000000 CMP     @DHSCR,#0       ;IF LINE BEING COMPARED IS LINE 0
010210  001002                BNE     5$
010212  005005                CLR     R5              ;EXPECTED BYTE COUNT=0
010214  005203                INC     R3              ;EXPECTED BUS ADDRESS = 1
010216  020504        5$:     CMP     R5,R4           ;IS BYTE COUNT CORRECT
010220  001401                BEQ     6$
010222                        HLT     4               ;BYTE COUNT ERROR
010222  104004                EMT     4
010224  020302        6$:     CMP     R3,R2           ;IS BUS ADDRESS CORRECT
010226  001401                BEQ     7$
010230                        HLT     3               ;BUS ADDRESS ERROR
```

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010230  104003                          EMT     3
010232  005277  005256          7$:     INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
010236  005201                          INC     R1
010240  005300                          DEC     R0                      ;CONTINUE IF ALL NOT DONE
010242  001350                          BNE     4$
010244  104400                  8$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
        000001                          LINE=LINE+1
        000002                  BITX=BITX+BITX
010246                          NPRTS2  \LINE,\BITX

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

010246                          TS \XN,10,8$
010246  012767  000340  167522  T31:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
010254  012767  000010  005300          MOV     #10,ICOUNT              ;SET UP FOR 10 ITERATIONS
010262  012767  010414  005266          MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000032                  XN=XN+1
010270  012777  004000  005216          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
                                                                        ;TO SET ALL TBMT BITS
010276  004767  005120                  JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
                                                                        ;BUS ADDRESS MEMORY LOCATIONS
010302  004767  005146                  JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
010306  012777  000002  005212          MOV     #2,@DHBAR               ;SET BAR BIT FOR LINE 1
010314  005777  005174          3$:     TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
010320  100375                          BPL     3$
010322  012700  000020                  MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
010326  005077  005162                  CLR     @DHSCR                  ;START AT LINE 0
010332  005001                          CLR     R1                      ;KEEP TRACK OF LINE NUMBER
010334  012705  177777          4$:     MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
                                                                        ;IF LINE NUMBER NOT = 1
010340  005003                          CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
                                                                        ;IF LINE NUMBER NOT = 1
010342  017704  005156                  MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
010346  017702  005150                  MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
010352  027727  005136  000001          CMP     @DHSCR,#1       ;IF LINE BEING COMPARED IS LINE 1
010360  001002                          BNE     5$
010362  005005                          CLR     R5                      ;EXPECTED BYTE COUNT=0
010364  005203                          INC     R3                      ;EXPECTED BUS ADDRESS = 1
010366  020504          5$:     CMP     R5,R4                   ;IS BYTE COUNT CORRECT
010370  001401                  BEQ     6$
010372                          HLT     4                       ;BYTE COUNT ERROR
010372  104004                  EMT     4
010374  020302          6$:     CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
010376  001401                  BEQ     7$
010400                          HLT     3                       ;BUS ADDRESS ERROR
010400  104003                  EMT     3
010402  005277  005106          7$:     INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
010406  005201                          INC     R1
```

```
010410  005300                  DEC     R0                      ;CONTINUE IF ALL NOT DONE
010412  001350                  BNE     4$
010414  104400          8$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
        000002                  LINE=LINE+1
        000004          BITX=BITX+BITX
010416                  NPRTS2  \LINE,\BITX

                        ;NPR LOGIC TEST
                        ;SET BYTE COUNT ON ALL LINES TO 1
                        ;SET BAR BIT FOR LINE 2
                        ;VERIFY THAT BYTE COUNT FOR LINE 2 GOES TO 0
                        ;VERIFY THAT BUS ADDRESS FOR LINE 2 IS INCREMENTED
                        ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
                        ;ARE UNCHANGED

010416                  TS \XN,10,8$
010416  012767  000340  167352  T32:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
010424  012767  000010  005130          MOV     #10,ICOUNT              ;SET UP FOR 10 ITERATIONS
010432  012767  010564  005116          MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                        .IF NB  <>
                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                        .ENDC
        000033          XN=XN+1
010440  012777  004000  005046          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
                                                                        ;TO SET ALL TBMT BITS
010446  004767  004750                  JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
                                                                        ;BUS ADDRESS MEMORY LOCATIONS
010452  004767  004776                  JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
010456  012777  000004  005042          MOV     #4,@DHBAR               ;SET BAR BIT FOR LINE 2
010464  005777  005024          3$:     TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
010470  100375                  BPL     3$
010472  012700  000020                  MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
010476  005077  005012                  CLR     @DHSCR                  ;START AT LINE 0
010502  005001                  CLR     R1                      ;KEEP TRACK OF LINE NUMBER
010504  012705  177777          4$:     MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT.
                                                                        ;IF LINE NUMBER NOT = 2
010510  005003                  CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS.
                                                                        ;IF LINE NUMBER NOT = 2
010512  017704  005006                  MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
010516  017702  005000                  MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
010522  027727  004766  000002          CMP     @DHSCR,#2       ;IF LINE BEING COMPARED IS LINE 2
010530  001002                  BNE     5$
010532  005005                  CLR     R5                              ;EXPECTED BYTE COUNT=0
010534  005203                  INC     R3                              ;EXPECTED BUS ADDRESS = 1
010536  020504          5$:     CMP     R5,R4                           ;IS BYTE COUNT CORRECT
010540  001401                  BEQ     6$
010542                  HLT     4                               ;BYTE COUNT ERROR
010542  104004                  EMT     4
010544  020302          6$:     CMP     R3,R2                           ;IS BUS ADDRESS CORRECT
010546  001401                  BEQ     7$
010550                  HLT     3                               ;BUS ADDRESS ERROR
010550  104003                  EMT     3
010552  005277  004736          7$:     INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
010556  005201                  INC     R1
010560  005300                  DEC     R0                              ;CONTINUE IF ALL NOT DONE
010562  001350                  BNE     4$
010564  104400          8$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
                000003                          LINE=LINE+1
                000010                  BITX=BITX+BITX
          010566                        NPRTS2  \LINE,\BITX

                                                ;NPR LOGIC TEST
                                                ;SET BYTE COUNT ON ALL LINES TO 1
                                                ;SET BAR BIT FOR LINE 3
                                                ;VERIFY THAT BYTE COUNT FOR LINE 3 GOES TO 0
                                                ;VERIFY THAT BUS ADDRESS FOR LINE 3 IS INCREMENTED
                                                ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
                                                ;ARE UNCHANGED

          010566                        TS \XN,10,8$
          010566  012767  000340  167202  T33:   MOV     #340,PS         ;DISABLE ALL INTERRUPTS
          010574  012767  000010  004760        MOV     #10,ICOUNT      ;SET UP FOR 10 ITERATIONS
          010602  012767  010734  004746        MOV     #8$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
                                        .IF NB  <>
                                                MOV     #,FREEZ1        ;SET UP TO LOOP WITH DATA       ; 3
                                        .ENDC
                000034                  XN=XN+1
          010610  012777  004000  004676        MOV     #BIT11,@DHSCR   ;MASTER CLEAR INTERFACE
                                                                        ;TO SET ALL TBMT BITS
          010616  004767  004600                JSR     PC,CLEAR        ;CLEAR ALL BYTE COUNT AND
                                                                        ;BUS ADDRESS MEMORY LOCATIONS
          010622  004767  004626                JSR     PC,LOAD         ;SET ALL BYTE COUNT LOCATIONS TO -1
          010626  012777  000010  004672        MOV     #10,@DHBAR      ;SET BAR BIT FOR LINE 3
          010634  005777  004654        3$:     TST     @DHSCR          ;WAIT FOR TRANSMITTER DONE
          010640  100375                        BPL     3$
          010642  012700  000020                MOV     #20,R0          ;SET UP TO CHECK ALL 16 LINES
          010646  005077  004642                CLR     @DHSCR          ;START AT LINE 0
          010652  005001                        CLR     R1              ;KEEP TRACK OF LINE NUMBER
          010654  012705  177777        4$:     MOV     #-1,R5          ;(R5)=EXPECTED BYTE COUNT,
                                                                        ;IF LINE NUMBER NOT = 3
          010660  005003                        CLR     R3              ,(R3)=EXPECTED BUS ADDRESS,
                                                                        ;IF LINE NUMBER NOT = 3
          010662  017704  004636                MOV     @DHBC,R4        ;(R4)=ACTUAL BYTE ACOUNT
          010666  017702  004630                MOV     @DHBA,R2        ;(R5)=ACTUAL BUS ADDRESS
          010672  027727  004616  000003        CMP     @DHSCR,#3       ;IF LINE BEING COMPARED IS LINE 3
          010700  001002                        BNE     5$
          010702  005005                        CLR     R5              ;EXPECTED BYTE COUNT=0
          010704  005203                        INC     R3              ;EXPECTED BUS ADDRESS = 1
          010706  020504                5$:     CMP     R5,R4           ;IS BYTE COUNT CORRECT
          010710  001401                        BEQ     6$
          010712                                HLT     4               ;BYTE COUNT ERROR
          010712  104004                        EMT     4
          010714  020302                6$:     CMP     R3,R2           ;IS BUS ADDRESS CORRECT
          010716  001401                        BEQ     7$
          010720                                HLT     3               ;BUS ADDRESS ERROR
          010720  104003                        EMT     3
          010722  005277  004566        7$:     INC     @DHSCR          ;PREPARE TO CHECK NEXT LINE
          010726  005201                        INC     R1
          010730  005300                        DEC     R0              ;CONTINUE IF ALL NOT DONE
          010732  001350                        BNE     4$
          010734  104400                8$:     SCOPE                   ;CHECK FOR ITERATIONS, LOOP
                000004                          LINE=LINE+1
                000020                  BITX=BITX+BITX
          010736                        NPRTS2  \LINE,\BITX
```

```
                                        ;NPR LOGIC TEST
                                        ;SET BYTE COUNT ON ALL LINES TO 1
                                        ;SET BAR BIT FOR LINE 4
                                        ;VERIFY THAT BYTE COUNT FOR LINE 4 GOES TO 0
                                        ;VERIFY THAT BUS ADDRESS FOR LINE 4 IS INCREMENTED
                                        ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
                                        ;ARE UNCHANGED

010736                          TS \XN,10,8$
010736  012767  000340  167032  T34:    MOV     #340,PS         ;DISABLE ALL INTERRUPTS
010744  012767  000010  004610          MOV     #10,ICOUNT      ;SET UP FOR 10 ITERATIONS
010752  012767  011104  004576          MOV     #8$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1        ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000035                  XN=XN+1
010760  012777  004000  004526          MOV     #BIT11,@DHSCR   ;MASTER CLEAR INTERFACE
                                                                ;TO SET ALL TBMT BITS
010766  004767  004430                  JSR     PC,CLEAR        ;CLEAR ALL BYTE COUNT AND
                                                                ;BUS ADDRESS MEMORY LOCATIONS
010772  004767  004456                  JSR     PC,LOAD         ;SET ALL BYTE COUNT LOCATIONS TO -1
010776  012777  000020  004522          MOV     #20,@DHBAR      ;SET BAR BIT FOR LINE 4
011004  005777  004504          3$:     TST     @DHSCR          ;WAIT FOR TRANSMITTER DONE
011010  100375                          BPL     3$
011012  012700  000020                  MOV     #20,R0          ;SET UP TO CHECK ALL 16 LINES
011016  005077  004472                  CLR     @DHSCR          ;START AT LINE 0
011022  005001                          CLR     R1              ;KEEP TRACK OF LINE NUMBER
011024  012705  177777          4$:     MOV     #-1,R5          ;(R5)=EXPECTED BYTE COUNT,
                                                                ;IF LINE NUMBER NOT = 4
011030  005003                          CLR     R3              ;(R3)=EXPECTED BUS ADDRESS,
                                                                ;IF LINE NUMBER NOT = 4
011032  017704  004466                  MOV     @DHBC,R4        ;(R4)=ACTUAL BYTE ACOUNT
011036  017702  004460                  MOV     @DHBA,R2        ;(R5)=ACTUAL BUS ADDRESS
011042  027727  004446  000004          CMP     @DHSCR,#4       ;IF LINE BEING COMPARED IS LINE 4
011050  001002                          BNE     5$
011052  005005                          CLR     R5              ;EXPECTED BYTE COUNT=0
011054  005203                          INC     R3              ;EXPECTED BUS ADDRESS = 1
011056  020504          5$:     CMP     R5,R4                   ;IS BYTE COUNT CORRECT
011060  001401                          BEQ     6$
011062                                  HLT     4               ;BYTE COUNT ERROR
011062  104004                          EMT     4
011064  020302          6$:     CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
011066  001401                          BEQ     7$
011070                                  HLT     3               ;BUS ADDRESS ERROR
011070  104003                          EMT     3
011072  005277  004416          7$:     INC     @DHSCR          ;PREPARE TO CHECK NEXT LINE
011076  005201                          INC     R1
011100  005300                          DEC     R0              ;CONTINUE IF ALL NOT DONE
011102  001350                          BNE     4$
011104  104400          8$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
        000005                  LINE=LINE+1
        000040                  BITX=BITX+BITX
011106                          NPRTS2  \LINE,\BITX

                                        ;NPR LOGIC TEST
                                        ;SET BYTE COUNT ON ALL LINES TO 1
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```
                                        ;SET BAR BIT FOR LINE 5
                                        ;VERIFY THAT BYTE COUNT FOR LINE 5 GOES TO 0
                                        ;VERIFY THAT BUS ADDRESS FOR LINE 5 IS INCREMENTED
                                        ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
                                        ;ARE UNCHANGED

011106                          TS \XN,10,8$
011106  012767  000340  166662  T35:   MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
011114  012767  000010  004440         MOV     #10,ICOUNT              ;SET UP FOR 10 ITERATIONS
011122  012767  011254  004426         MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000036                  XN=XN+1
011130  012777  004000  004356         MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
                                                                        ;TO SET ALL TBMT BITS
011136  004767  004260                 JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
                                                                        ;BUS ADDRESS MEMORY LOCATIONS
011142  004767  004306                 JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
011146  012777  000040  004352         MOV     #40,@DHBAR              ;SET BAR BIT FOR LINE 5
011154  105777  004334         3$:     TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
011160  100375                 BPL     3$
011162  012700  000020         MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
011166  005077  004322         CLR     @DHSCR                  ;START AT LINE 0
011172  005001                 CLR     R1                      ;KEEP TRACK OF LINE NUMBER
011174  012705  177777         4$:     MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
                                                                        ;IF LINE NUMBER NOT = 5
011200  005003                 CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
                                                                        ;IF LINE NUMBER NOT = 5
011202  017704  004316         MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
011206  017702  004310         MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
011212  027727  004276  000005         CMP     @DHSCR,#5       ;IF LINE BEING COMPARED IS LINE 5
011220  001002                 BNE     5$
011222  005005                 CLR     R5                              ;EXPECTED BYTE COUNT=0
011224  005203                 INC     R3                              ;EXPECTED BUS ADDRESS = 1
011226  020504         5$:     CMP     R5,R4                           ;IS BYTE COUNT CORRECT
011230  001401                 BEQ     6$
011232                         HLT     4                               ;BYTE COUNT ERROR
011232  104004                 EMT     4
011234  020302         6$:     CMP     R3,R2                           ;IS BUS ADDRESS CORRECT
011236  001401                 BEQ     7$
011240                         HLT     3                               ;BUS ADDRESS ERROR
011240  104003                 EMT     3
011242  005277  004246         7$:     INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
011246  005201                 INC     R1
011250  005300                 DEC     R0                              ;CONTINUE IF ALL NOT DONE
011252  001350                 BNE     4$
011254  104400         8$:     SCOPE                                   ;CHECK FOR ITERATIONS, LOOP
        000006                 LINE=LINE+1
        000100         BITX=BITX+BITX
011256                 NPRTS2  \LINE,\BITX

                                        ;NPR LOGIC TEST
                                        ;SET BYTE COUNT ON ALL LINES TO 1
                                        ;SFT BAR BIT FOR LINE 6
                                        ;VERIFY THAT BYTE COUNT FOR LINE 6 GOES TO 0
                                        ;VERIFY THAT BUS ADDRESS FOR LINE 6 IS INCREMENTED
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                                        ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
                                        ;ARE UNCHANGED

011256                          TS \XN,10,8$
011256  012767  000340  166512  T36:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
011264  012767  000010  004270          MOV     #10,ICOUNT              ;SET UP FOR 10 ITERATIONS
011272  012767  011424  004256          MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000037                  XN=XN+1
011300  012777  004000  004206          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
                                                                        ;TO SET ALL TBMT BITS
011306  004767  004110                  JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
                                                                        ;BUS ADDRESS MEMORY LOCATIONS
011312  004767  004136                  JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
011316  012777  000100  004202          MOV     #100,@DHBAR             ;SET BAR BIT FOR LINE 6
011324  005777  004164          3$:     TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
011330  100375                          BPL     3$
011332  012700  000020                  MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
011336  005077  004152                  CLR     @DHSCR                  ;START AT LINE 0
011342  005001                          CLR     R1                      ;KEEP TRACK OF LINE NUMBER
011344  012705  177777          4$:     MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
                                                                        ;IF LINE NUMBER NOT = 6
011350  005003                          CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
                                                                        ;IF LINE NUMBER NOT = 6
011352  017704  004146                  MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
011356  017702  004140                  MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
011362  027727  004126  000006          CMP     @DHSCR,#6       ;IF LINE BEING COMPARED IS LINE 6
011370  001002                          BNE     5$
011372  005005                          CLR     R5                      ;EXPECTED BYTE COUNT=0
011374  005203                          INC     R3                      ;EXPECTED BUS ADDRESS = 1
011376  020504          5$:     CMP     R5,R4                   ;IS BYTE COUNT CORRECT
011400  001401                          BEQ     6$
011402                                  HLT     4                       ;BYTE COUNT ERROR
011402  104004                          EMT     4
011404  020302          6$:     CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
011406  001401                          BEQ     7$
011410                                  HLT     3                       ;BUS ADDRESS ERROR
011410  104003                          EMT     3
011412  005277  004076          7$:     INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
011416  005201                          INC     R1
011420  005300                          DEC     R0                      ;CONTINUE IF ALL NOT DONE
011422  001350                          BNE     4$
011424  104400          8$:     SCOPE                                   ;CHECK FOR ITERATIONS, LOOP
        000007                  LINE=LINE+1
        000200          BITX=BITX+BITX
011426                  NPRTS2  \LINE,\BITX

                                        ;NPR LOGIC TEST
                                        ;SET BYTE COUNT ON ALL LINES TO 1
                                        ;SET BAR BIT FOR LINE 7
                                        ;VERIFY THAT BYTE COUNT FOR LINE 7 GOES TO 0
                                        ;VERIFY THAT BUS ADDRESS FOR LINE 7 IS INCREMENTED
                                        ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
                                        ;ARE UNCHANGED
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011426                          TS \XN,10,8$
011426  012767  000340  166342  T37:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
011434  012767  000010  004120          MOV     #10,ICOUNT              ;SET UP FOR 10 ITERATIONS
011442  012767  011574  004106          MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000040                  XN=XN+1
011450  012777  004000  004036          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
                                                                        ;TO SET ALL TBMT BITS
011456  004767  003740                  JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
                                                                        ;BUS ADDRESS MEMORY LOCATIONS
011462  004767  003766                  JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
011466  012777  000200  004032          MOV     #200,@DHBAR             ;SET BAR BIT FOR LINE 7
011474  005777  004014          3$:     TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
011500  100375                          BPL     3$
011502  012700  000020                  MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
011506  005077  004002                  CLR     @DHSCR                  ;START AT LINE 0
011512  005001                          CLR     R1                      ;KEEP TRACK OF LINE NUMBER
011514  012705  177777          4$:     MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
                                                                        ;IF LINE NUMBER NOT = 7
011520  005003                          CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
                                                                        ;IF LINE NUMBER NOT = 7
011522  017704  003776                  MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
011526  017702  003770                  MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
011532  027727  003756  000007          CMP     @DHSCR,#7       ;IF LINE BEING COMPARED IS LINE 7
011540  001002                          BNE     5$
011542  005005                          CLR     R5                      ;EXPECTED BYTE COUNT=0
011544  005203                          INC     R3                      ;EXPECTED BUS ADDRESS = 1
011546  020504          5$:     CMP     R5,R4                   ;IS BYTE COUNT CORRECT
011550  001401                          BEQ     6$
011552                                  HLT     4                       ;BYTE COUNT ERROR
011552  104004                          EMT     4
011554  020302          6$:     CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
011556  001401                          BEQ     7$
011560                                  HLT     3                       ;BUS ADDRESS ERROR
011560  104003                          EMT     3
011562  005277  003726          7$:     INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
011566  005201                          INC     R1
011570  005300                          DEC     R0                      ;CONTINUE IF ALL NOT DONE
011572  001350                          BNE     4$
011574  104400          8$:     SCOPE                                   ;CHECK FOR ITERATIONS, LOOP
        000010                  LINE=LINE+1
        000400          BITX=BITX+BITX
011576                  NPRTS2  \LINE,\BITX

                                ;NPR LOGIC TEST
                                ;SET BYTE COUNT ON ALL LINES TO 1
                                ;SET BAR BIT FOR LINE 10
                                ;VERIFY THAT BYTE COUNT FOR LINE 10 GOES TO 0
                                ;VERIFY THAT BUS ADDRESS FOR LINE 10 IS INCREMENTED
                                ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
                                ;ARE UNCHANGED

011576                          TS \XN,10,8$
011576  012767  000340  166172  T40:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
011604  012767  000010  003750          MOV     #10,ICOUNT              ;SET UP FOR 10 ITERATIONS
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011612  012767  011744  003736          MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000041                  XN=XN+1
011620  012777  004000  003666          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
                                                                        ;TO SET ALL TBMT BITS
011626  004767  003570                  JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
                                                                        ;BUS ADDRESS MEMORY LOCATIONS
011632  004767  003616                  JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
011636  012777  000400  003662          MOV     #400,@DHBAR             ;SET BAR BIT FOR LINE 10
011644  005777  003644          3$:     TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
011650  100375                          BPL     3$
011652  012700  000020                  MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
011656  005077  003632                  CLR     @DHSCR                  ;START AT LINE 0
011662  005001                          CLR     R1                      ;KEEP TRACK OF LINE NUMBER
011664  012705  177777          4$:     MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
                                                                        ;IF LINE NUMBER NOT = 10
011670  005003                          CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
                                                                        ;IF LINE NUMBER NOT = 10
011672  017704  003626                  MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
011676  017702  003620                  MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
011702  027727  003606  000010          CMP     @DHSCR,#10      ;IF LINE BEING COMPARED IS LINE 10
011710  001002                          BNE     5$
011712  005005                          CLR     R5                      ;EXPECTED BYTE COUNT=0
011714  005203                          INC     R3                      ;EXPECTED BUS ADDRESS = 1
011716  020504                  5$:     CMP     R5,R4                   ;IS BYTE COUNT CORRECT
011720  001401                          BEQ     6$
011722                                  HLT     4                       ;BYTE COUNT ERROR
011722  104004                          EMT     4
011724  020302                  6$:     CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
011726  001401                          BEQ     7$
011730                                  HLT     3                       ;BUS ADDRESS ERROR
011730  104003                          EMT     3
011732  005277  003556          7$:     INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
011736  005201                          INC     R1
011740  005300                          DEC     R0                      ;CONTINUE IF ALL NOT DONE
011742  001350                          BNE     4$
011744  104400                  8$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
        000011                          LINE=LINE+1
        001000                  BITX=BITX+BITX
011746                          NPRTS2  \LINE,\BITX

                                        ;NPR LOGIC TEST
                                        ;SET BYTE COUNT ON ALL LINES TO 1
                                        ;SET BAR BIT FOR LINE 11
                                        ;VERIFY THAT BYTE COUNT FOR LINE 11 GOES TO 0
                                        ;VERIFY THAT BUS ADDRESS FOR LINE 11 IS INCREMENTED
                                        ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
                                        ;ARE UNCHANGED

011746                          TS \XN,10,8$
011746  012767  000340  166022  T41:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
011754  012767  000010  003600          MOV     #10,ICOUNT              ;SET UP FOR 10 ITERATIONS
011762  012767  012114  003566          MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
```

```
                                .ENDC
                 000042         XN=XN+1
011770  012777  004000  003516        MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
                                                                      ;TO SET ALL TBMT BITS
011776  004767  003420                JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
                                                                      ;BUS ADDRESS MEMORY LOCATIONS
012002  004767  003446                JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
012006  012777  001000  003512        MOV     #1000,@DHBAR            ;SET BAR BIT FOR LINE 11
012014  005777  003474        3$:     TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
012020  100375                        BPL     3$
012022  012700  000020                MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
012026  005077  003462                CLR     @DHSCR                  ;START AT LINE 0
012032  005001                        CLR     R1                      ;KEEP TRACK OF LINE NUMBER
012034  012705  177777        4$:     MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT.
                                                                      ;IF LINE NUMBER NOT = 11
012040  005003                        CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS.
                                                                      ;IF LINE NUMBER NOT = 11
012042  017704  003456                MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
012046  017702  003450                MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
012052  027727  003436  000011        CMP     @DHSCR,#11      ;IF LINE BEING COMPARED IS LINE 11
012060  001002                        BNE     5$
012062  005005                        CLR     R5                      ;EXPECTED BYTE COUNT=0
012064  005203                        INC     R3                      ;EXPECTED BUS ADDRESS = 1
012066  020504        5$:     CMP     R5,R4                   ;IS BYTE COUNT CORRECT
012070  001401                        BEQ     6$
012072                                HLT     4                       ;BYTE COUNT ERROR
012072  104004                        EMT     4
012074  020302        6$:     CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
012076  001401                        BEQ     7$
012100                                HLT     3                       ;BUS ADDRESS ERROR
012100  104003                        EMT     3
012102  005277  003406        7$:     INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
012106  005201                        INC     R1
012110  005300                        DEC     R0                      ;CONTINUE IF ALL NOT DONE
012112  001350                        BNE     4$
012114  104400        8$:     SCOPE                                   ;CHECK FOR ITERATIONS, LOOP
                 000012         LINE=LINE+1
                 002000         BITX=BITX+BITX
012116                          NPRTS2  \LINE,\BITX

                                ;NPR LOGIC TEST
                                ;SET BYTE COUNT ON ALL LINES TO 1
                                ;SET BAR BIT FOR LINE 12
                                ;VERIFY THAT BYTE COUNT FOR LINE 12 GOES TO 0
                                ;VERIFY THAT BUS ADDRESS FOR LINE 12 IS INCREMENTED
                                ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
                                ;ARE UNCHANGED

012116                          TS \XN,10,8$
012116  012767  000340  165652  T42:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
012124  012767  000010  003430        MOV     #10,ICOUNT              ;SET UP FOR 10 ITERATIONS
012132  012767  012264  003416        MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
                 000043         XN=XN+1
012140  012777  004000  003346        MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
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                                                        ;TO SET ALL TBMT BITS
012146  004767  003250                JSR     PC,CLEAR      ;CLEAR ALL BYTE COUNT AND
                                                        ;BUS ADDRESS MEMORY LOCATIONS
012152  004767  003276                JSR     PC,LOAD       ;SET ALL BYTE COUNT LOCATIONS TO -1
012156  012777  002000  003342        MOV     #2000,@DHBAR  ;SET BAR BIT FOR LINE 12
012164  005777  003324        3$:     TST     @DHSCR        ;WAIT FOR TRANSMITTER DONE
012170  100375                BPL     3$
012172  012700  000020                MOV     #20,R0        ;SET UP TO CHECK ALL 16 LINES
012176  005077  003312                CLR     @DHSCR        ;START AT LINE 0
012202  005001                        CLR     R1            ;KEEP TRACK OF LINE NUMBER
012204  012705  177777        4$:     MOV     #-1,R5        ;(R5)=EXPECTED BYTE COUNT,
                                                        ;IF LINE NUMBER NOT = 12
012210  005003                        CLR     R3            ;(R3)=EXPECTED BUS ADDRESS,
                                                        ;IF LINE NUMBER NOT = 12
012212  017704  003306                MOV     @DHBC,R4      ;(R4)=ACTUAL BYTE ACOUNT
012216  017702  003300                MOV     @DHBA,R2      ;(R5)=ACTUAL BUS ADDRESS
012222  027727  003266  000012        CMP     @DHSCR,#12    ;IF LINE BEING COMPARED IS LINE 12
012230  001002                        BNE     5$
012232  005005                        CLR     R5            ;EXPECTED BYTE COUNT=0
012234  005203                        INC     R3            ;EXPECTED BUS ADDRESS = 1
012236  020504                5$:     CMP     R5,R4         ;IS BYTE COUNT CORRECT
012240  001401                        BEQ     6$
012242                                HLT     4             ;BYTE COUNT ERROR
012242  104004                        EMT     4
012244  020302                6$:     CMP     R3,R2         ;IS BUS ADDRESS CORRECT
012246  001401                        BEQ     7$
012250                                HLT     3             ;BUS ADDRESS ERROR
012250  104003                        EMT     3
012252  005277  003236        7$:     INC     @DHSCR        ;PREPARE TO CHECK NEXT LINE
012256  005201                        INC     R1
012260  005300                        DEC     R0            ;CONTINUE IF ALL NOT DONE
012262  001350                        BNE     4$
012264  104400                8$:     SCOPE                 ;CHECK FOR ITERATIONS, LOOP
        000013                        LINE=LINE+1
        004000                BITX=BITX+BITX
012266                        NPRTS2  \LINE,\BITX

                                ;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

012266                          TS \XN,10,8$
012266  012767  000340  165502  T43:    MOV     #340,PS       ;DISABLE ALL INTERRUPTS
012274  012767  000010  003260          MOV     #10,ICOUNT    ;SET UP FOR 10 ITERATIONS
012302  012767  012434  003246          MOV     #8$,ESCAPE    ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1      ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000044                  XN=XN+1
012310  012777  004000  003176          MOV     #BIT11,@DHSCR ;MASTER CLEAR INTERFACE
                                                        ;TO SET ALL TBMT BITS
012316  004767  003100                  JSR     PC,CLEAR      ;CLEAR ALL BYTE COUNT AND
                                                        ;BUS ADDRESS MEMORY LOCATIONS
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012322  004767  003126                  JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO  1
012326  012777  004000  003172          MOV     #4000,@DHBAR            ;SET BAR BIT FOR LINE 13
012334  005777  003154          3$:     TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
012340  100375                          BPL     3$
012342  012700  000020                  MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
012346  005077  003142                  CLR     @DHSCR                  ;START AT LINE 0
012352  005001                          CLR     R1                      ;KEEP TRACK OF LINE NUMBER
012354  012705  177777          4$:     MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
                                                                        ;IF LINE NUMBER NOT = 13
012360  005003                          CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
                                                                        ;IF LINE NUMBER NOT = 13
012362  017704  003136                  MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
012366  017702  003130                  MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
012372  027727  003116  000013          CMP     @DHSCR,#13      ;IF LINE BEING COMPARED IS LINE 13
012400  001002                          BNE     5$
012402  005005                          CLR     R5                      ;EXPECTED BYTE COUNT=0
012404  005203                          INC     R3                      ;EXPECTED BUS ADDRESS = 1
012406  020504                  5$:     CMP     R5,R4                   ;IS BYTE COUNT CORRECT
012410  001401                          BEQ     6$
012412                                  HLT     4                       ;BYTE COUNT ERROR
012412  104004                          EMT     4
012414  020302                  6$:     CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
012416  001401                          BEQ     7$
012420                                  HLT     3                       ;BUS ADDRESS ERROR
012420  104003                          EMT     3
012422  005277  003066          7$:     INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
012426  005201                          INC     R1
012430  005300                          DEC     R0                      ;CONTINUE IF ALL NOT DONE
012432  001350                          BNE     4$
012434  104400                  8$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
        000014                          LINE=LINE+1
        010000                  BITX=BITX+BITX
012436                          NPRTS2  \LINE,\BITX

                                        ;NPR LOGIC TEST
                                        ;SET BYTE COUNT ON ALL LINES TO 1
                                        ;SET BAR BIT FOR LINE 14
                                        ;VERIFY THAT BYTE COUNT FOR LINE 14 GOES TO 0
                                        ;VERIFY THAT BUS ADDRESS FOR LINE 14 IS INCREMENTED
                                        ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
                                        ;ARE UNCHANGED

012436                          TS \XN,10,8$
012436  012767  000340  165332  T44:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
012444  012767  000010  003110          MOV     #10,ICOUNT              ;SET UP FOR 10 ITERATIONS
012452  012767  012604  003076          MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000045                  XN=XN+1
012460  012777  004000  003026          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
                                                                        ;TO SET ALL TBMT BITS
012466  004767  002730                  JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
                                                                        ;BUS ADDRESS MEMORY LOCATIONS
012472  004767  002756                  JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
012476  012777  010000  003022          MOV     #10000,@DHBAR           ;SET BAR BIT FOR LINE 14
012504  005777  003004          3$:     TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
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012510  100375                          BPL     3$
012512  012700  000020                  MOV     #20,R0          ;SET UP TO CHECK ALL 16 LINES
012516  005077  002772                  CLR     @DHSCR          ;START AT LINE 0
012522  005001                          CLR     R1              ;KEEP TRACK OF LINE NUMBER
012524  012705  177777          4$:     MOV     #-1,R5          ;(R5)=EXPECTED BYTE COUNT,
                                                                ;IF LINE NUMBER NOT = 14
012530  005003                          CLR     R3              ;(R3)=EXPECTED BUS ADDRESS,
                                                                ;IF LINE NUMBER NOT = 14
012532  017704  002766                  MOV     @DHBC,R4        ;(R4)=ACTUAL BYTE ACOUNT
012536  017702  002760                  MOV     @DHBA,R2        ;(R5)=ACTUAL BUS ADDRESS
012542  027727  002746  000014          CMP     @DHSCR,#14      ;IF LINE BEING COMPARED IS LINE 14
012550  001002                          BNE     5$
012552  005005                          CLR     R5              ;EXPECTED BYTE COUNT=0
012554  005203                          INC     R3              ;EXPECTED BUS ADDRESS = 1
012556  020504          5$:     CMP     R5,R4           ;IS BYTE COUNT CORRECT
012560  001401                  BEQ     6$
012562                          HLT     4               ;BYTE COUNT ERROR
012562  104004                  EMT     4
012564  020302          6$:     CMP     R3,R2           ;IS BUS ADDRESS CORRECT
012566  001401                  BEQ     7$
012570                          HLT     3               ;BUS ADDRESS ERROR
012570  104003                  EMT     3
012572  005277  002716          7$:     INC     @DHSCR          ;PREPARE TO CHECK NEXT LINE
012576  005201                  INC     R1
012600  005300                  DEC     R0              ;CONTINUE IF ALL NOT DONE
012602  001350                  BNE     4$
012604  104400          8$:     SCOPE                   ;CHECK FOR ITERATIONS, LOOP
        000015                  LINE=LINE+1
        020000          BITX=BITX+BITX
012606                  NPRTS2  \LINE,\BITX

                        ;NPR LOGIC TEST
                        ;SET BYTE COUNT ON ALL LINES TO 1
                        ;SET BAR BIT FOR LINE 15
                        ;VERIFY THAT BYTE COUNT FOR LINE 15 GOES TO 0
                        ;VERIFY THAT BUS ADDRESS FOR LINE 15 IS INCREMENTED
                        ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
                        ;ARE UNCHANGED

012606                  TS \XN,10,8$
012606  012767  000340  165162  T45:    MOV     #340,PS         ;DISABLE ALL INTERRUPTS
012614  012767  000010  002740          MOV     #10,ICOUNT      ;SET UP FOR 10 ITERATIONS
012622  012767  012754  002726          MOV     #8$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
                        .IF NB  <>
                                MOV     #.,FREEZ1       ;SET UP TO LOOP WITH DATA       ; 3
                        .ENDC
        000046          XN=XN+1
012630  012777  004000  002656          MOV     #BIT11,@DHSCR   ;MASTER CLEAR INTERFACE
                                                                ;TO SET ALL TBMT BITS
012636  004767  002560                  JSR     PC,CLEAR        ;CLEAR ALL BYTE COUNT AND
                                                                ;BUS ADDRESS MEMORY LOCATIONS
012642  004767  002606                  JSR     PC,LOAD         ;SET ALL BYTE COUNT LOCATIONS TO -1
012646  012777  020000  002652          MOV     #20000,@DHBAR   ;SET BAR BIT FOR LINE 15
012654  005777  002634          3$:     TST     @DHSCR          ;WAIT FOR TRANSMITTER DONE
012660  100375                  BPL     3$
012662  012700  000020                  MOV     #20,R0          ;SET UP TO CHECK ALL 16 LINES
012666  005077  002622                  CLR     @DHSCR          ;START AT LINE 0
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012672  005001                          CLR     R1                      ;KEEP TRACK OF LINE NUMBER
012674  012705  177777          4$:     MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
                                                                        ;IF LINE NUMBER NOT = 15
012700  005003                          CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
                                                                        ;IF LINE NUMBER NOT = 15
012702  017704  002616                  MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
012706  017702  002610                  MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
012712  027727  002576  000015          CMP     @DHSCR,#15      ;IF LINE BEING COMPARED IS LINE 15
012720  001002                          BNE     5$
012722  005005                          CLR     R5                      ;EXPECTED BYTE COUNT=0
012724  005203                          INC     R3                      ;EXPECTED BUS ADDRESS = 1
012726  020504          5$:     CMP     R5,R4                   ;IS BYTE COUNT CORRECT
012730  001401                          BEQ     6$
012732                                  HLT     4                       ;BYTE COUNT ERROR
012732  104004                          EMT     4
012734  020302          6$:     CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
012736  001401                          BEQ     7$
012740                                  HLT     3                       ;BUS ADDRESS ERROR
012740  104003                          EMT     3
012742  005277  002546          7$:     INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
012746  005201                          INC     R1
012750  005300                          DEC     R0                      ;CONTINUE IF ALL NOT DONE
012752  001350                          BNE     4$
012754  104400          8$:     SCOPE                                   ;CHECK FOR ITERATIONS, LOOP
        000016                          LINE=LINE+1
        040000                  BITX=BITX+BITX
012756                          NPRTS2  \LINE,\BITX

                                        ;NPR LOGIC TEST
                                        ;SET BYTE COUNT ON ALL LINES TO 1
                                        ;SET BAR BIT FOR LINE 16
                                        ;VERIFY THAT BYTE COUNT FOR LINE 16 GOES TO 0
                                        ;VERIFY THAT BUS ADDRESS FOR LINE 16 IS INCREMENTED
                                        ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
                                        ;ARE UNCHANGED

012756                          TS \XN,10,8$
012756  012767  000340  165012  T46:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
012764  012767  000010  002570          MOV     #10,ICOUNT              ;SET UP FOR 10 ITERATIONS
012772  012767  013124  002556          MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000047                  XN=XN+1
013000  012777  004000  002506          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
                                                                        ;TO SET ALL TBMT BITS
013006  004767  002410                  JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
                                                                        ;BUS ADDRESS MEMORY LOCATIONS
013012  004767  002436                  JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
013016  012777  040000  002502          MOV     #40000,@DHBAR           ;SET BAR BIT FOR LINE 16
013024  005777  002464          3$:     TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
013030  100375                          BPL     3$
013032  012700  000020                  MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
013036  005077  002452                  CLR     @DHSCR                  ;START AT LINE 0
013042  005001                          CLR     R1                      ;KEEP TRACK OF LINE NUMBER
013044  012705  177777          4$:     MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
                                                                        ;IF LINE NUMBER NOT = 16
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013050  005003                          CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
                                                                        ;IF LINE NUMBER NOT = 16
013052  017704  002446                  MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
013056  017702  002440                  MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
013062  027727  002426  000016          CMP     @DHSCR,#16      ;IF LINE BEING COMPARED IS LINE 16
013070  001002                          BNE     5$
013072  005005                          CLR     R5                      ;EXPECTED BYTE COUNT=0
013074  005203                          INC     R3                      ;EXPECTED BUS ADDRESS = 1
013076  020504                  5$:     CMP     R5,R4                   ;IS BYTE COUNT CORRECT
013100  001401                          BEQ     6$
013102                                  HLT     4                       ;BYTE COUNT ERROR
013102  104004                          EMT     4
013104  020302                  6$:     CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
013106  001401                          BEQ     7$
013110                                  HLT     3                       ;BUS ADDRESS ERROR
013110  104003                          EMT     3
013112  005277  002376          7$:     INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
013116  005201                          INC     R1
013120  005300                          DEC     R0                      ;CONTINUE IF ALL NOT DONE
013122  001350                          BNE     4$
013124  104400                  8$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
        000017                          LINE=LINE+1
        100000                  BITX=BITX+BITX
013126                          NPRTS2  \LINE,\BITX

                                        ;NPR LOGIC TEST
                                        ;SET BYTE COUNT ON ALL LINES TO 1
                                        ;SET BAR BIT FOR LINE 17
                                        ;VERIFY THAT BYTE COUNT FOR LINE 17 GOES TO 0
                                        ;VERIFY THAT BUS ADDRESS FOR LINE 17 IS INCREMENTED
                                        ;VERIFY THAT BYTE COUNTS AND BUS ADDRESSES FOR ALL OTHER LINES
                                        ;ARE UNCHANGED

013126                          TS \XN,10,8$
013126  012767  000340  164642  T47:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
013134  012767  000010  002420          MOV     #10,ICOUNT              ;SET UP FOR 10 ITERATIONS
013142  012767  013274  002406          MOV     #8$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                        .IF NB  <>
                                MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                        .ENDC
        000050          XN=XN+1
013150  012777  004000  002336          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
                                                                        ;TO SET ALL TBMT BITS
013156  004767  002240                  JSR     PC,CLEAR                ;CLEAR ALL BYTE COUNT AND
                                                                        ;BUS ADDRESS MEMORY LOCATIONS
013162  004767  002266                  JSR     PC,LOAD                 ;SET ALL BYTE COUNT LOCATIONS TO -1
013166  012777  100000  002332          MOV     #100000,@DHBAR          ;SET BAR BIT FOR LINE 17
013174  005777  002314          3$:     TST     @DHSCR                  ;WAIT FOR TRANSMITTER DONE
013200  100375                          BPL     3$
013202  012700  000020                  MOV     #20,R0                  ;SET UP TO CHECK ALL 16 LINES
013206  005077  002302                  CLR     @DHSCR                  ;START AT LINE 0
013212  005001                          CLR     R1                      ;KEEP TRACK OF LINE NUMBER
013214  012705  177777          4$:     MOV     #-1,R5                  ;(R5)=EXPECTED BYTE COUNT,
                                                                        ;IF LINE NUMBER NOT = 17
013220  005003                          CLR     R3                      ;(R3)=EXPECTED BUS ADDRESS,
                                                                        ;IF LINE NUMBER NOT = 17
013222  017704  002276                  MOV     @DHBC,R4                ;(R4)=ACTUAL BYTE ACOUNT
```

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013226  017702  002270                  MOV     @DHBA,R2                ;(R5)=ACTUAL BUS ADDRESS
013232  027727  002256  000017          CMP     @DHSCR,#17      ;IF LINE BEING COMPARED IS LINE 17
013240  001002                          BNE     5$
013242  005005                          CLR     R5                      ;EXPECTED BYTE COUNT=0
013244  005203                          INC     R3                      ;EXPECTED BUS ADDRESS = 1
013246  020504                  5$:     CMP     R5,R4                   ;IS BYTE COUNT CORRECT
013250  001401                          BEQ     6$
013252                                  HLT     4                       ;BYTE COUNT ERROR
013252  104004                          EMT     4
013254  020302                  6$:     CMP     R3,R2                   ;IS BUS ADDRESS CORRECT
013256  001401                          BEQ     7$
013260                                  HLT     3                       ;BUS ADDRESS ERROR
013260  104003                          EMT     3
013262  005277  002226          7$:     INC     @DHSCR                  ;PREPARE TO CHECK NEXT LINE
013266  005201                          INC     R1
013270  005300                          DEC     R0                      ;CONTINUE IF ALL NOT DONE
013272  001350                          BNE     4$
013274  104400                  8$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
        000020                          LINE=LINE+1
        000000                  BITX=BITX+BITX
35      000000                  LINE=0
36      000000                  XLINE=LINE
37      000001                  BITX=1
38      000001                  XBIT=BITX
```

```
                                        ;SILO LOGIC TEST (MAINTENANCE MODE)
                                        ;FORCE 1 CHARACTER INTO SILO USING SILO
                                        ;MAINTENANCE BIT
                                        ;VERIFY THAT CHARACTER AVAILABLE INTERRUPT OCCURS
                                        ;VERIFY THAT CHARACTER AVAILABLE BIT IS
                                        ;SET IN SYSTEM CONTROL REGISTER
                                        ;VERIFY THAT SILO FILL REGISTER INCREMENTS TO 1
                                        ;VERIFY THAT NEXT RECEIVED CHARACTER REGISTER
                                        ;VALID DATA BIT IS SET
                                        ;VERIFY THAT CORRECT DATA PATTERN WAS RECEIVED

013276                          TS \XN,10,5$
013276  012767  000340  164472  T50:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
013304  012767  000010  002250          MOV     #10,ICOUNT              ;SET UP FOR 10 ITERATIONS
013312  012767  013454  002236          MOV     #5$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                        MOV     #,FREEZ1                ;SET UP TO LOOP WITH DATA       ; 3
                                .ENDC
        000051                  XN=XN+1
013320  012777  004000  002166          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
013326  012777  013374  002202          MOV     #2$,@DHRVEC             ;SET UP RECEIVER INTERRUPT
013334  012777  000340  002176          MOV     #340,@DHRLVL            ;VECTOR AND STATUS
013342  052777  100000  002162          BIS     #BIT15,@DHSSR           ;SET SILO MAINTENANCE
013350  012777  000100  002136          MOV     #BIT06,@DHSCR           ;SET RECEIVER INTERRUPT ENABLE
013356  005067  164414                  CLR     PS                      ;ALLOW INTERRUPTS
013362  012700  001000                  MOV     #1000,R0                ;SET UP DELAY FOR SILO LOAD
013366  005300                  1$:     DEC     R0                      ;DELAY FOR SILO LOAD
013370  001376                          BNE     1$
013372                                  HLT     1                       ;NO CHARACTER AVAILABLE INTERRUPT OCCURED
013372  104001                          EMT     1
013374  042777  100000  002130  2$:     BIC     #BIT15,@DHSSR           ;CLEAR SILO MAINTENANCE BIT
013402  105777  002106                  TSTB    @DHSCR                  ;IS CHARACTER AVAILABLE BIT SET
013406  100401                          BMI     3$
013410                                  HLT     5                       ;CHARACTER AVAILABLE NOT, ERROR
013410  104005                          EMT     5
013412  017703  002114          3$:     MOV     @DHSSR,R3               ;READ SILO STATUS REGISTER
013416  017704  002074                  MOV     @DHNRC,R4               ;(R4)=ACTUAL DATA IN NEXT
                                                                        ;RECEIVED CHARACTER REGISTER
013422  012705  125252                  MOV     #125252,R5              ;(R5)=EXPECTED DATA IN
                                                                        ;NEXT RECEIVED CHARACTER REGISTER
013426  020504                          CMP     R5,R4                   ;IS DATA IN SILO CORRECT
013430  001401                          BEQ     4$
013432                                  HLT     6                       ;SILO DATA ERROR
013432  104006                          EMT     6
013434  010304                  4$:     MOV     R3,R4                   ;GET SILO STATUS REGISTER
013436  042704  000300                  BIC     #300,R4                 ;CLEAR UNWANTED BITS
013442  012705  000400                  MOV     #400,R5                 ;(R5)=EXPECTED DATA
                                                                        ;IN SILO STATUS REGISTER
013446  020504                          CMP     R5,R4                   ;CHECK RESULTS
013450  001401                          BEQ     5$
013452                                  HLT     7                       ;SILO STATUS ERROR
013452  104007                          EMT     7
013454  012706  017270          5$:     MOV     #STACK,SP               ;RESTORE STACK
013460  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP

                                        ;SILO LOGIC TEST (MAINTENANCE MODE)
```

```
                                        ;LOAD 63(DECIMAL) CHARACTERS INTO SILO
                                        ;VERIFY THAT SILO STATUS REGISTER COUNTS UP CORRECTLY

013462                          TS \XN,1,5$,1$
013462  012767  000340  164306  T51:    MOV     #340,PS             ;DISABLE ALL INTERRUPTS
013470  012767  000001  002064          MOV     #1,ICOUNT           ;SET UP FOR 1 ITERATIONS
013476  012767  013614  002052          MOV     #5$,ESCAPE          ;SET UP TO ESCAPE TO NEXT TEST
                        .IF NB  <1$>
013504  012767  013516  002046          MOV     #1$,FREEZ1          ;SET UP TO LOOP WITH DATA       ; 3
                        .ENDC
        000052          XN=XN+1
013512  012701  000001                  MOV     #1,R1               ;SET UP TO LOAD SILO WITH 1 CHARACTER
013516  012777  004000  001770  1$:     MOV     #BIT11,@DHSCR       ;MASTER CLEAR INTERFACE
013524  010100                          MOV     R1,R0               ;SAVE COUNT
013526  005005                          CLR     R5                  ;WILL BE COUNT OF CHARACTERS LOADED
013530  052777  100000  001774  2$:     BIS     #BIT15,@DHSSR       ;LOAD A CHARACTER
013536  012702  001000                  MOV     #1000,R2            ;STALL FOR SILO
013542  005302                  3$:     DEC     R2
013544  001376                          BNE     3$
013546  042777  100000  001756          BIC     #BIT15,@DHSSR       ;CLEAR LOAD BIT
013554  005205                          INC     R5                  ;UPDATE COUNT OF CHARACTERS LOADED
013556  005300                          DEC     R0                  ;IF ALL CHARACTERS NOT LOADED
013560  001363                          BNE     2$                  ;LOAD ANOTHER
013562  017704  001744                  MOV     @DHSSR,R4           ;READ SILO STATUS REGISTER
013566  042704  000300                  BIC     #300,R4             ;CLEAR UNWANTED BITS
013572  000304                          SWAB    R4                  ;GET DATA INTO LOW BYTE
013574  020504                          CMP     R5,R4               ;COMPARE
013576  001401                          BEQ     4$
013600                                  HLT     7                   ;SILO STATUS ERROR
013600  104007                          EMT     7
013602  104410                  4$:     SCOPE1                      ;CHECK FOR LOOP WITH CURRENT
                                                                    ;LOAD COUNT (R5)
013604  005201                          INC     R1                  ;ADD 1 TO NUMBER OF CHARACTERS
                                                                    ;TO BE LOADED INTO SILO
013606  022701  000100                  CMP     #100,R1             ;CONTINUE UNTIL SILO IS FULL
013612  001341                          BNE     1$
013614  104400                  5$:     SCOPE

                                        ;SILO LOGIC TEST (MAINTENANCE MODE)
                                        ;LOAD 64 (DECIMAL CHARACTERS INTO SILO
                                        ;READ CHARACTERS OUT OF SILO
                                        ;VERIFY THAT SILO STATUS REGISTER COUNTS DOWN CORRECTLY

013616                          TS \XN,1,7$,1$
013616  012767  000340  164152  T52:    MOV     #340,PS             ;DISABLE ALL INTERRUPTS
013624  012767  000001  001730          MOV     #1,ICOUNT           ;SET UP FOR 1 ITERATIONS
013632  012767  013774  001716          MOV     #7$,ESCAPE          ;SET UP TO ESCAPE TO NEXT TEST
                        .IF NB  <1$>
013640  012767  013652  001712          MOV     #1$,FREEZ1          ;SET UP TO LOOP WITH DATA       ; 3
                        .ENDC
        000053          XN=XN+1
013646  012701  000001                  MOV     #1,R1               ;SET UP TO READ 1 CHARACTER
013652  012777  004000  001634  1$:     MOV     #BIT11,@DHSCR       ;MASTER CLEAR INTERFACE
013660  012705  000100                  MOV     #100,R5         ;SILO STATUS COUNT SHOULD BE
013664  160105                          SUB     R1,R5               ;100(OCTAL)-NUMBER
                                                                    ;OF CHARACTERS READ
013666  012700  000100                  MOV     #100,R0             ;SET UP TO LOAD SILO
```

```
     89 013672  012702  001000          2$:   MOV   #1000,R2              ;SET UP DELAY
     90 013676  052777  100000  001626        BIS   #BIT15,@DHSSR          ;LOAD 1 CHARACTER
     91 013704  005302                  3$:   DEC   R2                    ;DELAY
     92 013706  001376                        BNE   3$
     93 013710  042777  100000  001614        BIC   #BIT15,@DHSSR          ;CLEAR SILO LOAD BIT
     94 013716  005300                        DEC   R0                    ;CONTINUE IF SILO NOT FULL
     95 013720  001364                        BNE   2$
     96 013722  010100                        MOV   R1,R0                 ;SET UP TO READ SILO
     97 013724  012702  001000          4$:   MOV   #1000,R2              ;SET UP DELAY FOR SILO
     98 013730  005777  001562                TST   @DHNRC                ;READ SILO
     99 013734  005302                  5$:   DEC   R2                    ;DELAY FOR SILO
    100 013736  001376                        BNE   5$
    101 013740  005300                        DEC   R0                    ;UPDATE NUMBER OF CHARACTER S TO BE READ
    102 013742  001370                        BNE   4$                    ;CONTINUE READING
    103 013744  117704  001564                MOVB  @DHSLR,R4             ;READ SILO STATUS REGISER
    104 013750  042704  000300                BIC   #300,R4               ;CLEAR UNWANTED BITS
    105                                                                   ;(R5)=EXPECTED SILO STATUS
    106                                                                   ;(IN UPPER BYTE)
    107                                                                   ;(R4)=ACTUAL SILO STATUS
    108                                                                   ;(IN UPPER BYTE)
    109 013754  020504                        CMP   R5,R4                 ;COMPARE EXPECTED AND RECEIVED DATA
    110 013756  001401                        BEQ   6$
    111 013760                                HLT   7                     ;SILO STATUS ERROR
        013760  104007                        EMT   7
    112 013762  104410                  6$:   SCOPE1                      ;CHECK FOR LOOP WITH SAME READ COUNT
    113 013764  005201                        INC   R1                    ;UPDATE COUNT OF CHARACTERS TO BE READ
    114 013766  020127  000101                CMP   R1,#101         ;CONTINUE IF NOT DONE
    115 013772  001327                        BNE   1$
    116 013774  104400                  7$:   SCOPE
```

```
                                        ;SILO LOGIC TEST (MAINTENANCE MODE)
                                        ;SET SILO ALARM LEVEL TO ALL VALUES 0-77
                                        ;VERIFY THAT CHARACTER AVAILABLE FLAG
                                        ;DOES NOT SET UNTIL SILO FILL LEVEL IS GREATER THAN
                                        ;SILO ALARM LEVEL

 8 013776                       TS \XN,40,5$,1$
   013776  012767  000340  163772 T53:    MOV     #340,PS          ;DISABLE ALL INTERRUPTS
   014004  012767  000040  001550         MOV     #40,ICOUNT       ;SET UP FOR 40 ITERATIONS
   014012  012767  014152  001536         MOV     #5$,ESCAPE       ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <1$>
   014020  012767  014030  001532         MOV     #1$,FREEZ1       ;SET UP TO LOOP WITH DATA        ; 3
                                .ENDC
           000054                       XN=XN+1
 9 014026  005005                       CLR     R5               ;START AT ALARM LEVEL 0
10 014030  012777  004000  001456 1$:    MOV     #BIT11,@DHSCR    ;MASTERCLEAR INTERFACE
11 014036  010577  001470               MOV     R5,@DHSSR        ;SET ALARM LEVEL
12 014042  010501                       MOV     R5,R1            ;SET FILL COUNT
13 014044  005201                       INC     R1               ;ONE MORE THAN ALARM LEVEL
14 014046  052777  100000  001456 2$:    BIS     #BIT15,@DHSSR    ;LOAD A CHARACTER
15 014054  012700  001000               MOV     #1000,R0         ;WAIT FOR SILO TO SETTLE
16 014060  005300                       DEC     R0
17 014062  001376                       BNE     .-2
18 014064  042777  100000  001440       BIC     #BIT15,@DHSSR    ;CLEAR MAINTENANCE BIT
19 014072  005301                       DEC     R1               ;UPDATE FILL COUNT
20 014074  105777  001414               TSTB    @DHSCR           ;IS CHARACTER AVAILABLE FLAG SET
21 014100  100406                       BMI     3$               ;YES
22 014102  005701                       TST     R1               ;CHARACTER AVAILALBE FLAG NOT SET
23 014104  001360                       BNE     2$               ;SHOULD IT BE
24 014106  117703  001422               MOVB    @DHSLR,R3        ;READ SILO FILL LEVEL
25 014112                               HLT     10               ;SILO ALARM ERROR
   014112  104010                       EMT     10
26                                                              ;NO CHARACTER AVAILABLE WHEN EXPECTED
27 014114  000406                       BR      4$
28 014116  020127  000001       3$:    CMP     R1,#1
29 014122  003403                       BLE     4$
30 014124  117703  001404               MOVB    @DHSLR,R3        ;READ SILO FILL LEVEL
31 014130                               HLT     10               ;SILO ALARM ERROR
   014130  104010                       EMT     10
32 014132  104410               4$:    SCOPE1                   ;CHECK FOR FREEZE AT CURRENT ALARM LEVEL
33 014134  005705                       TST     R5
34 014136  001001                       BNE     10$
35 014140  000261                       SEC
36 014142  006105              10$:    ROL     R5               ;GO TO NEXT ALARM LEVEL
37 014144  022705  000100               CMP     #100,R5          ;CONTINUE IF NOT DONE
38 014150  001327                       BNE     1$
39 014152  104400               5$:    SCOPE                    ;CHECK FOR ITERATIONS, LOOP
```

```
      1
      2 014154                          .EOP    ↑/BEGIN/

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

 014154  104401                 EOP:    TYPE                            ;TYPE NAME OF TEST
 014156  016217                         MEPASS
 014160  005067  001426                 CLR     LAST                    ;CLEAR LAST ERROR PC
 014164  005067  001356                 CLR     ERRFLG                  ;CLEAR ERROR FLAG
 014170  005267  001354                 INC     PASCNT                  ;UPDATE PASS COUNT
 014174  005767  164602                 TST     LIGHTS                  ; ARE WE USING LIGHTS?          ; 4
 014200  001005                        BNE     2$                      ; BRANCH IF WE ARE              ; 6
 014202  104401                        TYPE                            ; TYPE PASCOUNT MESSAGE         ; 5
 014204  016232                        PASTXT                                                          ; 5
 014206  104402                        OCTASC                          ; PRINT PASSCOUNT               ; 4
 014210  014246                        PASARG                                                                  ;4 ; 6
 014212  000403                        BR      3$                      ; CONTINUE                      ; 4
 014214                         2$:                                                                    ; 4
 014214  016767  001330  164560        MOV     PASCNT,LIGHTS           ;DISPLAY PASS COUNT
 014222                         3$:                                                                    ; 4
 014222  013701  000042                MOV     @#42,R1                 ;CHECK FOR ACT-11 OR DDP
 014226  001405                        BEQ     RESTRT                  ;IF NOT, CONTINUE TESTING
 014230  000005                        RESET
 014232  004711                 LOGICAL:       JSR     PC,(R1)
 014234  000240                        NOP
 014236  000240                        NOP
 014240  000240                        NOP
 014242  000167  165100         RESTRT: JMP     BEGIN
 014246  000001                 PASARG: .WORD   1                       ; PARAMETERS TO PRINT PASSCOUNT  ; 5
 014250     006     002                 .BYTE   6,2                                                     ; 5
 014252  015550                        .WORD   PASCNT                                                  ; 5
      3 014254                  .SCOPE

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

 014254  032777  002000  164516 SCOPER: BIT     @#SW10,@SWR                                            ; 4
 014262  001030                        BNE     4$
 014264  032777  040000  1645C6 1$:     BIT     @#SW14,@SWR                                            ; 4
 014272  001021                        BNE     3$
 014274  032777  004000  164476        BIT     @#SW11,@SWR                                            ; 4
 014302  001006                        BNE     2$
 014304  005267  001254                INC     LPCNT
 014310  026767  001250  001244        CMP     LPCNT,ICOUNT
 014316  001007                        BNE     3$
 014320  005067  001240         2$:    CLR     LPCNT
 014324  005067  001216                CLR     ERRFLG
 014330  011667  001220                MOV     (SP),RETRN
 014334  000002                        RTI
 014336  016716  001212         3$:    MOV     RETRN,(SP)
 014342  000002                        RTI
 014344  005767  001176         4$:    TST     ERRFLG
 014350  001745                        BEQ     1$
```

```
 014352  000762                          BR      2$
4 014354                          .SCOP1

                                  ;CHECK FOR FREEZE ON CURRENT DATA

 014354  03277.  001000  164416  SCOP1R: BIT     #SW09,@SWR                      ; 4
 014362  001402                          BEQ     1$
 014364  016716  001170                  MOV     FREEZ1,(SP)
 014370  000002                  1$:     RTI
5 014372                          .ERROR

                                  ;ERROR HANDLER

 014372  032777  020000  164400  ERRORS: BIT     #SW13,@SWR                      ; 4
 014400  001055                          BNE     HALTS
 014402  021667  001204                  CMP     (SP),LAST
 014406  001404                          BEQ     1$
 014410  011667  001176                  MOV     (SP),LAST
 014414  005067  001126                  CLR     ERRFLG
 014420  104406                  1$:     SAV05P
 014422  011605                          MOV     (SP),R5
 014424  162705  000002                  SUB     #2,R5
 014430  011504                          MOV     (R5),R4
 014432  006304                          ASL     R4
 014434  006304                          ASL     R4
 014436  042704  177001                  BIC     #177001,R4
 014442  062704  016352                  ADD     #ERRTAB,R4
 014446  012467  000040                  MOV     (R4)+,ERRMSG
 014452  011467  000052                  MOV     (R4),DATABP
 014456  005767  001064                  TST     ERRFLG
 014462  001403                          BEQ     TYPMSG
 014464  005767  000040                  TST     DATABP
 014470  001011                          BNE     TYPDAT                          ; 3
 014472  104401                  TYPMSG: TYPE                                    ; 5
 014474  016127                          MCRLF                                   ; 5
 014476  104402                          OCTASC                                  ; 5
 014500  014576                          ERTABO                                  ; 5
 014502  012767  000001  001036          MOV     #1,ERRFLG
 014510  104401                          TYPE
 014512  000000                  ERRMSG: 0
 014514  005767  000010          TYPDAT: TST     DATABP
 014520  001404                          BEQ     RESREG
 014522  104401                          TYPE                                    ; 5
 014524  016127                          MCRLF                                   ; 5
 014526  104402                          OCTASC
 014530  000000                  DATABP: 0
 014532  104407                  RESREG: RES05
 014534  005777  164240          HALTS:  TST     @SWR                            ; 4
 014540  100005                          BPL     EXITER
 014542  010046                          PUSHR0
 014544  016600  000002                  MOV     2(SP),R0
 014550  000000                          HALT
 014552  012600                          POPR0
 014554  00526~  000772          EXITER: INC     ERRCNT
 014560  032777  002000  164212          BIT     #SW10,@SWR                      ; 4
 014566  001402                          BEQ     1$
 014570  016716  000762                  MOV     ESCAPE,(SP)
```

```
 014574  000002                 1$:     RTI
 014576  000001                 ERTABO: 1
 014600     006     002                 .BYTE   6,2
 014602  015604                         SAVPC
6 014604                        .TRPSRV
                                ;TRAP DISPATCH SERVICE
                                ;ARGUMENT OF TRAP IS EXTRACTED
                                ;AND USED AS OFFSET TO OBTAIN POINTER                                   ; 3
                                ;TO SELECTED SUBROUTINE

 014604  011646                 TRPSRV: MOV     (SP),-(SP)              ;GET PC OF RETURN
 014606  162716  000002                 SUB     #2,(SP)                 ;=PC OF TRAP
 014612  017616  000000                 MOV     @(SP),(SP)              ;GET TRP
 014616  006316                 TRPOK:  ASL     (SP)                    ;MULTIPLY TRAP ARG BY 2
 014620  042716  177001                 BIC     #177001,(SP)            ;CLEAR UNWANTED BITS
 014624  062716  016272                 ADD     #TRPTAB,(SP)            ;POINTER TO SUBROUTINE ADDRESS
 014630  017616  000000                 MOV     @(SP),(SP)              ;SUBROUTINE ADDRESS
 014634  000136                         JMP     @(SP)+                  ;GO TO SUBROUTINE
7 014636                        .TYPER

                                ;TELETYPE OUTPUT ROUTINE

 014636  017605  000000         TYPER:  MOV     @(SP),R5                                                ; 3
 014642  062716  000002                 ADD     #2,(SP)
 014646  105777  000636         1$:     TSTB    @TPCSR
 014652  100375                         BPL     1$
 014654  105715                         TSTB    (R5)
 014656  001001                         BNE     2$
 014660  000002                         RTI
 014662  112577  000624         2$:     MOVB    (R5)+,@TPDBR
 014666  000767                         BR      1$
8 014670                        .INSTRG

                                ;ASCII STRING INPUT ROUTINE

 014670  017667  000000  000006 INSTRG: MOV     @(SP),MSG
 014676  062716  000002                 ADD     #2,(SP)
 014702  104401                 INSTR1: TYPE
 014704  000000                 MSG:    0
 014706  012704  016314                 MOV     #INBUF,R4
 014712  012703  000007                 MOV     #7,R3
 014716  105777  000562         1$:     TSTB    @TKCSR
 014722  100375                         BPL     1$
 014724  117714  000556                 MOVB    @TKDBR,(R4)
 014730  142714  000200                 BICB    #200,(R4)
 014734  122427  000015                 CMPB    (R4)+,#15
 014740  001413                         BEQ     INSTR2
 014742  117777  000540  000542         MOVB    @TKDBR,@TPDBR
 014750  105777  000534         2$:     TSTB    @TPCSR
 014754  100375                         BPL     2$
 014756  005303                         DEC     R3
 014760  001356                         BNE     1$
 014762  104401                 INSTRE: TYPE
 014764  016123                         MQM
 014766  000745                         BR      INSTR1
 014770  000002                 INSTR2: RTI
9 014772                        .PARAMS
```

```
                                        ;CONVERT ASCII STRING TO OCTAL                                  ; 3

014772  011605                  PARAMS: MOV     (SP),R5
014774  012567  000146                  MOV     (R5)+,LOLIM
015000  012567  000144                  MOV     (R5)+,HILIM
015004  012567  000142                  MOV     (R5)+,DEVADR
015010  112567  000140                  MOVB    (R5)+,LOBITS
015014  112567  000135                  MOVB    (R5)+,ADRCNT
015020  010516                          MOV     R5,(SP)
015022  005005                  PARAM1: CLR     R5
015024  012704  016314                  MOV     #INBUF,R4
015030  122714  000015                  CMPB    #15,(R4)
015034  001420                          BEQ     PARERR
015036  121427  000060          1$:     CMPB    (R4),#60
015042  002415                          BLT     PARERR
015044  121427  000067                  CMPB    (R4),#67
015050  003012                          BGT     PARERR
015052  142714  000060                  BICB    #60,(R4)
015056  152405                          BISB    (R4)+,R5
015060  122714  000015                  CMPB    #15,(R4)
015064  001406                          BEQ     LIMITS
015066  006305                          ASL     R5
015070  006305                          ASL     R5
015072  006305                          ASL     R5
015074  000760                          BR      1$
015076  104404                  PARERR: INSTER
015100  000750                          BR      PARAM1

                                        ;TEST TO SEE IF NUMBER IS WITHIN LIMITS

015102  020567  000042          LIMITS: CMP     R5,HILIM
015106  101373                          BHI     PARERR
015110  020567  000032                  CMP     R5,LOLIM
015114  103770                          BLO     PARERR
015116  136705  000032                  BITB    LOBITS,R5                                               ; 3
015122  001365                          BNE     PARERR

                                        ;STORE NUMBER AT SPECIFIED ADDRESS

015124  016704  000022                  MOV     DEVADR,R4
015130  010524                  1$:     MOV     R5,(R4)+
015132  062705  000002                  ADD     #2,R5
015136  105367  000013                  DECB    ADRCNT
015142  001372                          BNE     1$
015144  000002                          RTI
015146  000000                  LOLIM:  0
015150  000000                  HILIM:  0
015152  000000                  DEVADR: 0
015154  000000                  LOBITS: 0
        015155                  ADRCNT=LOBITS+1
10 015156                       .OCTASC

                                        ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER

015156  017601  000000          OCTASN: MOV     @(SP),R1                                                ; 5
015162  062716  000002                  ADD     #2,(SP)
```

```
015166  012167  000130          MOV     (R1)+,WRDCNT
015172  112167  000126  1$:     MOVB    (R1)+,CHRCNT
015176  112167  000123          MOVB    (R1)+,SPACNT                    ; 3
015202  013167  000120          MOV     @(R1)+,BINWRD
015206  016704  000114  2$:     MOV     BINWRD,R4
015212  116705  000106          MOVB    CHRCNT,R5
015216  012700  016326          MOV     #TEMP,R0
015222  010403          3$:     MOV     R4,R3
015224  042703  177770          BIC     #177770,R3
015230  062703  000260          ADD     #260,R3
015234  110320                  MOVB    R3,(R0)+
015236  006204                  ASR     R4
015240  006204                  ASR     R4
015242  006204                  ASR     R4
015244  005305                  DEC     R5
015246  001365                  BNE     3$
015250  012703  016340          MOV     #MDATA,R3
015254  114023          4$:     MOVB    -(R0),(R3)+
015256  105367  000042          DECB    CHRCNT
015262  001374                  BNE     4$
015264  105767  000035          TSTB    SPACNT
015270  001405                  BEQ     6$
015272  112723  000240  5$:     MOVB    #240,(R3)+
015276  105367  000023          DECB    SPACNT
015302  001373                  BNE     5$
015304  105013          6$:     CLRB    (R3)
015306  104401                  TYPE
015310  016340                  MDATA
015312  005367  000004          DEC     WRDCNT
015316  001325                  BNE     1$
015320  000002                  RTI
015322  000000          WRDCNT: 0
015324  000000          CHRCNT: 0
        015325          SPACNT=CHRCNT+1
015326  000000          BINWRD: 0
11 015330               .SAVREG

                                ;SAVE PC OF TEST THAT FAILED AND R0-R5

015330  016667  000004  000246  SV05P:  MOV     4(SP),SAVPC

                                ;SAVE R0-R5

015336  010567  000236          SV05:   MOV     R5,SAVR5
015342  010467  000230                  MOV     R4,SAVR4                ; 3
015346  010367  000222                  MOV     R3,SAVR3
015352  010267  000214                  MOV     R2,SAVR2
015356  010167  000206                  MOV     R1,SAVR1
015362  010067  000200                  MOV     R0,SAVR0
015366  000002                  RTI
12 015370               .RESREG
                                ;RESTORE R0-R5

015370  016700  000172          RS05:   MOV     SAVR0,R0
015374  016701  000170                  MOV     SAVR1,R1
015400  016702  000166                  MOV     SAVR2,R2
015404  016703  000164                  MOV     SAVR3,R3
```

```
        015410  016704  000162          MOV     SAVR4,R4
        015414  016705  000160          MOV     SAVR5,R5
        015420  000002                  RTI
     13 015422                  CLRBCA

                                        ;CLEAR BYTE COUNT AND BUS ADDRESS MEMORIES

        015422  012700  000020  CLEAR:  MOV     #20,R0          ;SET UPT TO CLEAR 16 (DECIMAL) LOCATIONS
        015426  005077  000C62          CLR     @DHSCR          ;START AT LOCATION 0
        015432  005077  0C0066  1$:     CLR     @DHBC           ;CLEAR BYTE COUNT
        015436  005077  000060          CLR     @DHBA           ;CLEAR BUS ADDRESS
        015442  005277  000046          INC     @DHSCR          ;ADVANCE LINE NUMBER
        015446  005300                  DEC     R0              ;CONTINUE IF NOT DONE
        015450  001370                  BNE     1$
        015452  000207                  RTS     PC              ;RETURN
     14 015454                  LDBC

                                        ;LOAD ALL BYTE COUNT MEMORY LOCATIONS WITH -1

        015454  012700  000020  LOAD:   MOV     #20,R0          ;SET UP TO LOAD 16 (DECIMAL) LOCATIONS
        015460  005077  000030          CLR     @DHSCR          ;START WITH LINE 0
        015464  012777  177777  000032  2$:     MOV     #-1,@DHBC       ;SET BYTE COUNT TO -1
        015472  005277  000016          INC     @DHSCR          ;ADVANCE LINE NUMBER
        015476  005300                  DEC     R0              ;CONTINUE IF NOT DONE
        015500  001371                  BNE     2$
        015502  000207                  RTS     PC              ;RETURN TO CALLING ROUTINE
     15 015504                  .POINT  ↑/DHSCR,DHNRC,DHLPR,DHBA,DHBC,DHBAR,DHBCR,DHSSR,DHSLR,DHRVEC,DHRLVL,DHTVEC,DHTLVL/
                                        ;INDIRECT POINTERS                                                      ; 3

        015504  177560          TKCSR:  177560
        015506  177562          TKDBR:  177562
        015510  177564          TPCSR:  177564
        015512  177566          TPDBR:  177566
                                .IRP    A       <DHSCR,DHNRC,DHLPR,DHBA,DHBC,DHBAR,DHBCR,DHSSR,DHSLR,DHRVEC,DHRLVL,DHTVEC,DH
TLVL>
                                A:      0
                                .ENDM
        015514  000000          DHSCR:  0
        015516  000000          DHNRC:  0
        015520  000000          DHLPR:  0
        015522  000000          DHBA:   0
        015524  0000C0          DHBC:   0
        015526  000000          DHBAR:  0
        015530  000000          DHBCR:  0
        015532  000000          DHSSR:  0
        015534  000000          DHSLR:  0
        015536  000000          DHRVEC: 0
        015540  000000          DHRLVL: 0
        015542  000000          DHTVEC: 0
        015544  000000          DHTLVL: 0
     16 015546                  .VARIA  ↑/HCORE/
                                        ;PROGRAM VARIABLES

        015546  000000          ERRFLG: 0               ;ERROR FLAG
        015550  000000          PASCNT: 0               ;PASS COUNT
        015552  000000          ERRCNT: 0               ;ERROR COUNT
        015554  000000          RETRN:  0               ;SCOPE RETURN ADDRESS FOR TEST LOOPING
        015556  000000          ESCAPE: 0               ;ADDRESS FOR ERROR ESCAPE
```

```
015560  000000                  FREEZ1: 0               ;DATA LOOPING RETURN ADDRESS
015562  000000                  ICOUNT: 0               ;ITERATION COUNT FOR TEST IN PROGRESS
015564  000000                  LPCNT:  0               ;NUMBER OF ITERATIONS THIS TEST
015566  000000                  SAVR0:  0               ;R0 SAVE AREA
015570  000000                  SAVR1:  0               ;R1 SAVE AREA
015572  000000                  SAVR2:  0               ;R2 SAVE AREA                          ; 3
015574  000000                  SAVR3:  0               ;R3 SAVE ARE
015576  000000                  SAVR4:  0               ;R4 SAVE AREA
015600  000000                  SAVR5:  0               ;R5 SAVE AREA
015602  000000                  SAVSP:  0               ;STACK POINTER SAVE AREA
015604  000000                  SAVPC:  0               ;CALLING ROUTINE SAVE AREA
015606  000000                  INIFLG: 0               ;PROGRAM INITIALIZATION FLAG
015610  000000                  STFLG:  0               ;PROGRAM START FLAG
015612  000000                  LAST:   0               ;LAST ERROR PC
                                .IRP    A       <HCORE>
                                A:      0
                                .ENDM
015614  000000                  HCORE:  0
   17 015616                    .PFAIL
                                        ;ENTER HERE ON POWER FAILURE

015616  010046                  PFAIL:  MOV     R0,-(SP)                ;SAVE R0-R5 ON PROCESSOR STACK
015620  010146                          MOV     R1,-(SP)
015622  010246                          MOV     R2,-(SP)
015624  010346                          MOV     R3,-(SP)
015626  010446                          MOV     R4,-(SP)
015630  010546                          MOV     R5,-(SP)
015632  016746  162166                  MOV     24,-(SP)
015636  010667  177740                  MOV     SP,SAVSP                ;SAVE STACK POINTER
015642  012767  015654  162154          MOV     #RESTART,24             ;SET UP FOR POWER UP TRAP      ; 3
015650  000000                          HALT                            ;HALT ON POWER DOWN NORMAL
015652  000777                          BR      .

                                        ;PROCESSOR WILL TRAP HERE WHEN POWER IS RESTORED

015654  016706  177722          RESTAR: MOV     SAVSP,SP                ;RESTORE STACK POINTER
015660  012605                          MOV     (SP)+,R5                ;RESTORE R0-R5
015662  012604                          MOV     (SP)+,R4
015664  012603                          MOV     (SP)+,R3
015666  012602                          MOV     (SP)+,R2
015670  012601                          MOV     (SP)+,R1
015672  012600                          MOV     (SP)+,R0
015674  012767  015616  162122          MOV     #PFAIL,24               ;SET UP FOR POWER FAILURE
015702  012767  000340  162066          MOV     #340,PS
015710  012706  017270                  MOV     #STACK,SP
015714  005067  000406                  CLR     TEMP
015720  005267  000402                  INC     TEMP
015724  001375                          BNE     .-4
015726  104401                          TYPE                                                   ; 5
015730  016127                          MCRLF                                                  ; 5
015732  104402                          OCTASC
015734  015756                          PFTAB
015736  104401                          TYPE
015740  016132                          MPFAIL
015742  005067  177600                  CLR     ERRFLG
015746  005067  177640                  CLR     LAST
```

```
        015752  000177  177576                  JMP     @RETRN
        015756  000001                  PFTAB:  1
        015760  000006  000002                  6.2
        015764  015554                          RETRN
    18  015766                          .MSG    ↑/DH11 TRANSMITTER AND RECEIVER LOGIC TEST/,↑/CZDHC-CO/
        015766     015     012     012  MTITLE: .ASCIZ  <15><12><12>/DH11 TRANSMITTER AND RECEIVER LOGIC TEST /<15><12>
        015771     104     110     061
        015774     061     040     124
        015777     122     101     116
        016002     123     115     111
        016005     124     124     105
        016010     122     040     101
        016013     116     104     040
        016016     122     105     103
        016021     105     111     126
        016024     105     122     040
        016027     114     117     107
        016032     111     103     040
        016035     124     105     123
        016040     124     040     015
        016043     012     000
        016045     015     012     126  MVECTO: .ASCIZ  <15><12>/VECTOR ADDRESS-/
        016050     105     103     124
        016053     117     122     040
        016056     101     104     104
        016061     122     105     123
        016064     123     055     000
        016067     015     012     103  MREGAD: .ASCIZ  <15><12>/CONTROL REGISTER ADDRESS-/
        016072     117     116     124
        016075     122     117     114
        016100     040     122     105
        016103     107     111     123
        016106     124     105     122
        016111     040     101     104
        016114     104     122     105
        016117     123     123     055
        016122     000
        016123     040     040     077  MQM:    .ASCIZ  /  ?/
        016126     000
        016127     015     012     000  MCRLF:  .ASCIZ   <15><12>

        016132     040     040     120  MPFAIL: .ASCIZ  /  POWER FAILURE, PROGRAM RESTART AT TEST IN PROGRESS/
        016135     117     127     105
        016140     122     040     106
        016143     101     111     114
        016146     125     122     105
        016151     054     040     120
        016154     122     117     107
        016157     122     101     115
        016162     040     122     105
        016165     123     124     101
        016170     122     124     040
        016173     101     124     040
        016176     124     105     123
        016201     124     040     111
        016204     116     040     120
        016207     122     117     107
```

```
        016212      122     105     123
        016215      123     000
        016217      015     012     103  MEPASS: .ASCIZ  <15><12>/CZDHC-CO/
        016222      132     104     110
        016225      103     055     103
        016230      060     000
        016232      015     012     120  PASTXT: .ASCIZ  <15><12>/PASS COUNT = /          ; 5
        016235      101     123     123
        016240      040     103     117
        016243      125     116     124
        016246      040     075     040
        016251      000
        016252      015     012     122  MR:     .ASCIZ  <15><12>/R/
        016255      000
        016256      015     012     124  MTSTPC: .ASCIZ  <15><12>/TEST PC-/
        016261      105     123     124
        016264      040     120     103
        016267      055     000

                                         .EVEN
     19 016272                           .TRPTAB

                                                 ;TABLE OF POINTERS FOR TRAP DECODING

        016272  014254                   TRPTAB: SCOPER
        016274  014636                           TYPER
        016276  015156                           OCTASN
        016300  014670                           INSTRG
        016302  014762                           INSTRE
        016304  014772                           PARAMS
        016306  015330                           SV05P
        016310  015370                           RS05
        016312  014354                           SCOP1R
     20 016314                           .BUFFER

                                                 ;BUFFERS FOR INPUT-OUTPUT

        016314  000000                   INBUF:  0
                016326                   .=.+10
        016326  000000                   TEMP:   0
                016340                   .=.+10

        016340  000000                   MDATA:  0
                016352                   .=.+10
     21 016352                           .ERRTAB

                                                 ;TABLE OF POINTERS TO ERROR MESSAGES AND DATA

        016352                           ERRTAB:
     22 016352  016416                           EM0
     23 016354  017044                           DT1
     24 016356  016476                           EM1
     25 016360  000000                           0
     26 016362  016513                           EM2
     27 016364  000000                           0
     28 016366  016544                           EM3
     29 016370  017044                           DT1
     30 016372  016603                           EM4
```

```
     31 016374  017044                              DT1
     32 016376  016641                              EM5
     33 016400  000000                              0
     34 016402  016675                              EM6
     35 016404  017044                              DT1
     36 016406  016732                              EM7
     37 016410  017044                              DT1
     38 016412  016771                              EM10
     39 016414  017056                              DT2
     40 016416     125     116     105  EM0:     .ASCII  /UNEXPECTED INTERRUPT/
        016421     130     120     105
        016424     103     124     105
        016427     104     040     111
        016432     116     124     105
        016435     122     122     125
        016440     120     124
     41 016442     015     012     103          .ASCIZ  <15><12>/CONTROL REGISTER CONTENTS/
        016445     117     116     124
        016450     122     117     114
        016453     040     122     105
        016456     107     111     123
        016461     124     105     122
        016464     040     103     117
        016467     116     124     105
        016472     116     124     123
        016475     000
     42 016476     116     117     040  EM1:     .ASCIZ  /NO INTERRUPT/
        016501     111     116     124
        016504     105     122     122
        016507     125     120     124
        016512     000
     43 016513     124     122     101  EM2:     .ASCIZ  /TRANSMITTER DONE NOT SET/
        016516     116     123     115
        016521     111     124     124
        016524     105     122     040
        016527     104     117     116
        016532     105     040     116
        016535     117     124     040
        016540     123     105     124
        016543     000
     44 016544     102     125     123  EM3:     .ASCII  /BUS ADDRESS ERROR/
        016547     040     101     104
        016552     104     122     105
        016555     123     123     040
        016560     105     122     122
        016563     117     122
     45 016565     015     012     105          .ASCIZ  <15><12>/EXP     REC/
        016570     130     120     040
        016573     040     040     040
        016576     040     122     105
        016601     103     000
     46 016603     102     131     124  EM4:     .ASCII  /BYTE COUNT ERROR/
        016606     105     040     103
        016611     117     125     116
        016614     124     040     105
        016617     122     122     117
        016622     122
```

```
 47 016623     015     012     105          .ASCIZ  <15><12>/EXP     REC/
    016626     130     120     040
    016631     040     040     040
    016634     040     122     105
    016637     103     000
 48 016641     103     110     101  EM5:    .ASCIZ  /CHARACTER AVAILABLE NOT SET/
    016644     122     101     103
    016647     124     105     122
    016652     040     101     126
    016655     101     111     114
    016660     101     102     114
    016663     105     040     116
    016666     117     124     040
    016671     123     105     124
    016674     000
 49 016675     123     111     114  EM6:    .ASCII  /SILO DATA ERROR/
    016700     117     040     104
    016703     101     124     101
    016706     040     105     122
    016711     122     117     122
 50 016714     015     012     105          .ASCIZ  <15><12>/EXP     REC/
    016717     130     120     040
    016722     040     040     040
    016725     040     122     105
    016730     103     000
 51 016732     123     111     114  EM7:    .ASCII  /SILO STATUS ERROR/
    016735     117     040     123
    016740     124     101     124
    016743     125     123     040
    016746     105     122     122
    016751     117     122
 52 016753     015     012     105          .ASCIZ  <15><12>/EXP     REC/
    016756     130     120     040
    016761     040     040     040
    016764     040     122     105
    016767     103     000
 53 016771     123     111     114  EM10:   .ASCII  /SILO ALARM ERROR/
    016774     117     040     101
    016777     114     101     122
    017002     115     040     105
    017005     122     122     117
    017010     122
 54 017011     015     012     101          .ASCIZ  <15><12>/ALARM LEVEL  FILL LEVEL/
    017014     114     101     122
    017017     115     040     114
    017022     105     126     105
    017025     114     040     040
    017030     106     111     114
    017033     114     040     114
    017036     105     126     105
    017041     114     000
 55                                  .EVEN
 56
 57                                  ;DATA TABLES FOR ERROR OUTPUT
 58
 59 017044  000002                  DT1:    2
 60 017046     006     002          .BYTE   6,2
```

```
 61 017050  015600                          SAVR5
 62 017052     006      000          .BYTE   6,0
 63 017054  015576                          SAVR4
 64 017056  000002                   DT2:   2
 65 017060     002      014          .BYTE   2,14
 66 017062  015600                          SAVR5
 67 017064     002      000          .BYTE   2,0
 68 017066  015574                          SAVR3
 69 017070                           .ENDCOD
    017070  000000                   ENDCOD: 0
 70         000001                   .END
```

SYMBOL TABLE

```
ADRCNT= 015155        EM3     016544        MREGAD  016067        SIZE    001162        T17     005260
BEGIN   001346        EM4     016603        MSG     014704        SPACNT= 015325        T2      001622
BINWRD  015326        EM5     016641        MTITLE  015766        STACK = 017270        T20     005516
BITX  = 000001        EM6     016675        MTSTPC  016256        START   001004        T21     005754
BIT00 = 000001        EM7     016732        MVECTO  016045        STFLG   015610        T22     006212
BIT01 = 000002        ENDCOD  017070        N     = 000001        SV05    015336        T23     006450
BIT02 = 000004        EOP     014154        OCTASC= 104402        SV05P   015330        T24     006706
BIT03 = 000010        ERRCNT  015552        OCTASN  015156        SWR     001000        T25     007144
BIT04 = 000020        ERRFLG  015546        PARAM = 104405        SW00  = 000001        T26     007402
BIT05 = 000040        ERRMSG  014512        PARAMS  014772        SW01  = 000002        T27     007640
BIT06 = 000100        ERRORS  014372        PARAM1  015022        SW02  = 000004        T3      002004
BIT07 = 000200        ERRTAB  016352        PARERR  015076        SW03  = 000010        T30     010076
BIT08 = 000400        ERTABO  014576        PASARG  014246        SW04  = 000020        T31     010246
BIT09 = 001000        ESCAPE  015556        PASCNT  015550        SW05  = 000040        T32     010416
BIT10 = 002000        EXITER  014554        PASTXT  016232        SW06  = 000100        T33     010566
BIT11 = 004000        FREEZ1  015560        PFAIL   015616        SW08  = 000400        T34     010736
BIT12 = 010000        HALTS   014534        PFTAB   015756        SW09  = 001000        T35     011106
BIT13 = 020000        HCORE   015614        POPRO = 012600        SW10  = 002000        T36     011256
BIT14 = 040000        HILIM   015150        POP1SP= 005726        SW11  = 004000        T37     011426
BIT15 = 100000        ICOUNT  015562        POP2SP= 022626        SW12  = 010000        T4      002166
CHRCNT  015324        INBUF   016314        PS    = 177776        SW13  = 020000        T40     011576
CLEAR   015422        INIFLG  015606        PUSHRO= 010046        SW14  = 040000        T41     011746
DATABP  014530        INSTER= 104404        PUSH1S= 005746        SW15  = 100000        T42     012116
DEVADR  015152        INSTR = 104403        PUSH2S= 02464(        TEMP    016326        T43     012266
DHBA    015522        INSTRE  014762        RESREG  014532        TKCSR   015504        T44     012436
DHBAR   015526        INSTRG  014670        RESTAR  015654        TKDBR   015506        T45     012606
DHBC    015524        INSTR1  014702        RESTRT  014242        TPCSR   015510        T46     012756
DHBCR   015530        INSTR2  014770        RES05 = 104407        TPDBR   015512        T47     013126
DHLPR   015520        LAST    015612        RETRN   015554        TRPOK   014616        T5      002360
DHNRC   015516        LIGHTS  001002        RS05    015370        TRPSRV  014604        T50     013276
DHRLVL  015540        LIMITS  015102        SAVPC   015604        TRPTAB  016272        T51     013462
DHRVEC  015536        LINE  = 000000        SAVR0   015566        TYPDAT  014514        T52     013616
DHSCR   015514        LOAD    015454        SAVR1   015570        TYPE  = 104401        T53     013776
DHSLR   015534        LOBITS  015154        SAVR2   015572        TYPER   014636        T6      002552
DHSSR   015532        LOGICA  014232        SAVR3   015574        TYPMSG  014472        T7      002744
DHTLVL  015544        LOLIM   015146        SAVR4   015576        T1      001440        VEC1    001224
DHTVEC  015542        LPCNT   015564        SAVR5   015600        T10     003136        VEC2    001234
DT1     017044        MCRLF   016127        SAVSP   015602        T11     003374        WRDCNT  015322
DT2     017056        MDATA   016340        SAV05P= 104406        T12     003632        X     = 000000
EM0     016416        MEPASS  016217        SCOPE = 104400        T13     004070        XBIT  = 000001
EM1     016476        MPFAIL  016132        SCOPER  014254        T14     004326        XLINE = 000000
EM10    016771        MQM     016123        SCOPE1= 104410        T15     004564        XN    = 000054
EM2     016513        MR      016252        SCOP1R  014354        T16     005022        Y     = 000011

. ABS.  017072      000
        000000      001
ERRORS DETECTED:  0

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