DH11

CHARACTER LENGTH × BASIC

MD-11-DZDHE-B

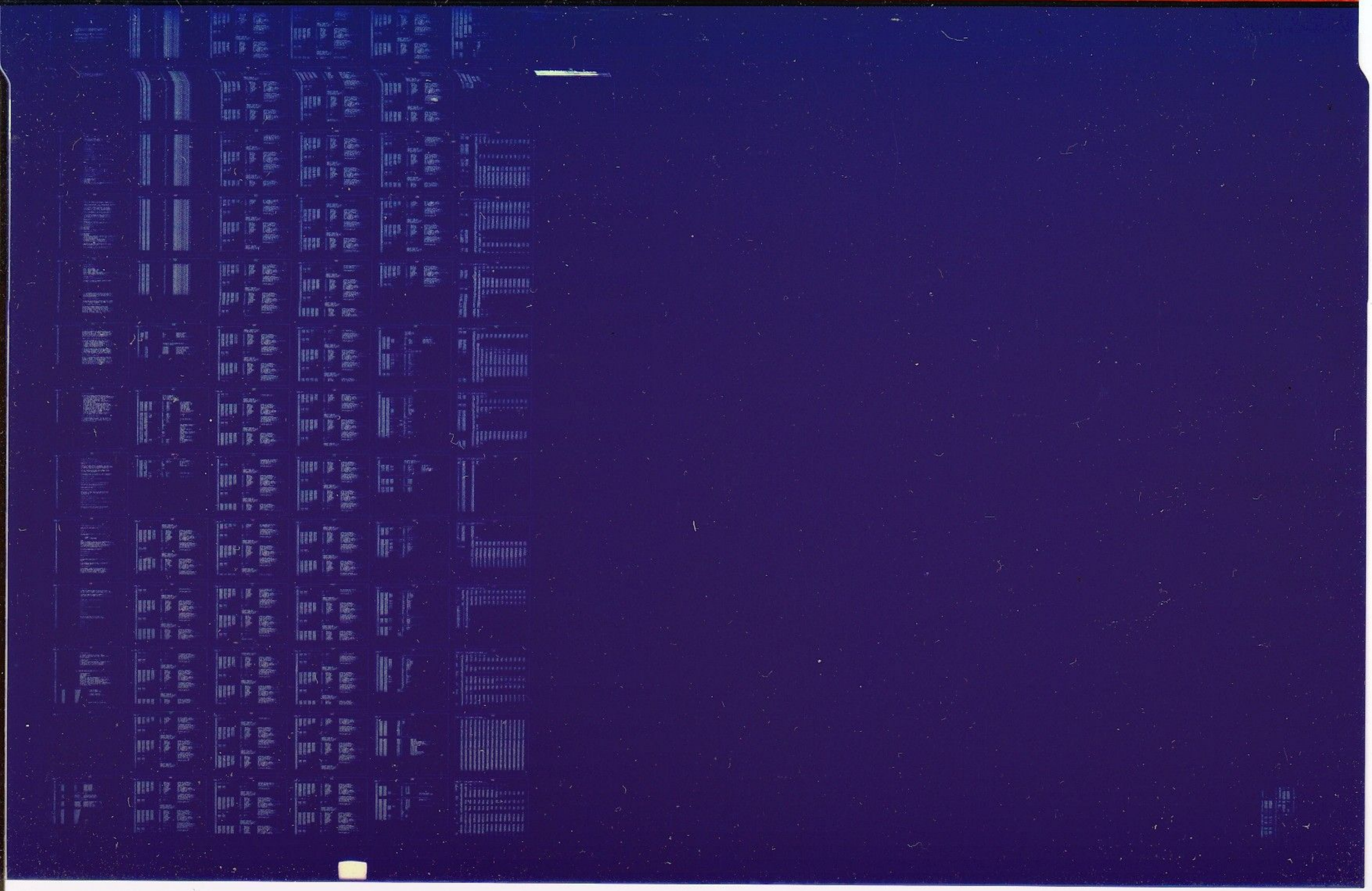
EP-DZDHE-B-DL-A

OCT 1976

digital

Made In U.S.A.

FICHE 1 OF 1



.REM !

IDENTIFICATION

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

PRODUCT NAME: DH11 CHARACTER LENGTH AND BASIC DATA TEST

DATE: MAY 1976

MAINTAINER: DIAGNOSTIC GROUP

AUTHOR: MICHAEL DAVIS

1. ABSTRACT

THE DH11 CHARACTER LENGTH AND BASIC DATA TEST VERIFIES
THAT CHARACTER LENGTH CAN BE SELECTED CORRECTLY ON
EACH LINE CORRECTLY, AND THAT THE CORRECT
LINE NUMBER AND CHARACTER STATUS ARE RECEIVED ON
EACH LINE SELECTED FOR TRANSMISSION.

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                                2.      REQUIREMENTS

                                2.1     EQUIPMENT

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

                                2.2     STORAGE

                                        THE PROGRAM LOADS INTO 4KW OF MEMORY

                                3.      LOADING PROCEDURE

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

                                4.      STARTING PROCEDURE

                                4.1     CONTROL SWITCH SETTINGS

                                4.1.1   AFTER PROGRAM LOAD (INITIAL PROGRAM START)

                                        ALL CONSOLE SWITCHES DOWN

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

                                        SW00=1

                                4.1.3   TO START PROGRAM AT SELECTED TEST AFTER PROGRAM RESTART

                                        SW01=1

                                4.2     STARTING ADDRESS

                                        THE STARTING ADDRESS FOR ALL TESTS IS 000200

                                        THE RESTART ADDRESS FOR ALL TESTS I 0002000

                                        THE STARTING ADDRESS TO ENTER A SELECTED TEST IS 000200

                                4.3     PROGRAM AND/OR OPERATOR ACTION

                                4.3.1   INITIAL PROGRAM START

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

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

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

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

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

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

4.3.2 PROGRAM RESTART WITH ALL SWITCHES DOWN

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

4.3.3 PROGRAM RESTART WITH SW00=1

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

4.3.4 PROGRAM RESTART WITH SW01=1

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

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

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

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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

                                                2040
                                                0
                                                ...
                                                772
                                                0
                                                776
                                                0

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

                                5.2.2   START   (PROGRAM INITIALIZATION)

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

                                5.2.3   BEGIN   (PROGRAM START AND RESTART)

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

5.2.4 EOP (END OF PASS)

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

5.2.5 SCOPER (SCOPE LOOP AND ITERATION HANDLER)

THIS ROUTINE IS ENTERED EACH TIME A TEST IS COMPLETED. THE ROUTINE CHECKS FOR THE FOLLOWING UPON ENTRY

A) IF SW10=1, THE ROUTINE WILL TRANSFER TO THE NEXT TEST IN SEQUENCE, AFTER CLEARING ERROR FLAGS.
B) IF SW11=1, THE ROUTINE WILL TRANSFER TO THE NEXT TEST SEQUENCE, AFTER CLEARING ERROR FLAGS.
C) IF SW14=1, THE ROUTINE WILL LOOP ON THE CURRENT TEST REGARDLESS OF THE ITERATION COUNT.

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

5.2.6 SCOP1R (FREEZE ON CURRENT DATA)

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

5.2.7 ERRORS (ERROR HANDLER)

THIS ROUTINE IS ENTERED UPON ERROR DETECTION ONLY.
WITH ALL CONSOLE SWITCHES DOWN, THE ROUTINE PROCEDES AS FOLLOWS:

A) THE PC OF THE INSTRUCTION THAT CALLED THE ERROR HANDLER
   IS ACCESSED THRU THE STACK, AND THEN THE EMT INSTRUCTION
   ITSELF IS FETCHED. THE 8 LSB OF THE EMT
   INSTRUCTION ARE THE ERROR CODE. THIS CODE IS
   USED TO ACCESS A TABLE OF ERROR MESSAGES AND ERROR
   DATA STORAGE LOCATIONS.

B) IF THE TEST THAT FAILED DID NOT FAIL PREVIOUSLY
   DURING THIS PASS, A COMPLETE ERROR REPORT IS MADE
   IF THE TEST THAT FAILED FAILED MOR THAT ONCE DURING
   THE CURRENT PASS, ONLY THE DATA RELATING TO THE FAILUER
   IS TYPED. IF SW13=1, NO ERROR TYPEOUT IS MADE.

C) THE ROUTINE NOW CHECKS FOR HALT ON ERROR. IF SW15=1
   THE PROGRAM WILL HALT WITH THE PC OF THE CALL TO
   THE ERROR ROUTINE IN R0. IF SW15=0, THE PROGRAM WILL
   NOT HALT, BUT WILL CHECK FOR ESCAPE TO NEXT TEST.

D) IF SW10=0, THE ROUTINE WILL RETURN
   TO THE TEST IN PROGRESS. IF SW10=1, THE ROUTINE WILL
   ABORT THE CURRENT TEST, AND TRANSFER TO THE NEXT
   TEST IN SEQUENCE, THRU THE ROUTINE "SCOPER".

5.2.8 TRPSRV (TRAP DECODE AND DISPATCH)

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

5.3 PROGRAM AND OR OPERATOR ACTION

5.3.1 PROGRAM START WITH ALL SWITCHES DOWN

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

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

5.3.1.3 WHEN ALL ITERATIONS HAVE BEEN COMPLETED, THE PROGRAM WILL TYPE "DZDHE" 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 "DZDHE" 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.

```
406
407                                     6.3     SCOPE LOOPING
408
409                                     6.3.1   TO SCOPE ON A SPECIFIC TEST, SET SW14=1 AND SW13=1
410                                             THIS WILL CAUSE THE PROGRAM TO CONTINUOUSLY LOOP ON THE
411                                             SAME TEST, AND WILL CAUSE ALL ERROR TYPEOUTS TO BE INHIBITED
412
413                                     6.3.2   TO SCOPE ON A SPECIFIC VALUE OF A PARAMETER WITHIN
414                                             A TEST, SET SW09=1 TO FREEZE THE DATA
415                                             (SEE LISTING FOR THOSE TESTS THAT INCORPORATE THIS FEATURE)
416
417                                     6.      (CONT'D)
418
419                                     6.3.3   PROGRAM START TO SCOPE LOOP ON SELECTED TEST
420
421                                             PERFORM SECTION 4.3.4 WITH SW14=1
422
423                                     7.      RESTRICTIONS
424
425                                     7.1     STARTING
426
427                                             THE DH11 TEST CARD MUST BE INSTALLED
428
429                                     7.2     RUNNING
430
431                                             NONE
432
433                                     8.      MISCELLANEOUS
434
435                                     8.1     EXECUTION TIME
436
437                                             THE TIME FOR ONE PASS OF THE PROGRAM (END OF
438                                             TYPEOUT OF DZDHE TO END OF TYPEOUT OF DZDHE)
439                                             IS GIVEN FOR VARIOUS PROCESSORS IN THE TABLE BELOW
440
441                                                             TIME
442                                             PROCESSOR
443
444                                             PDP-11/05,10
445
446                                             PDP-11/20
447
448                                             PDP-11/40
449
450                                             PDP-11/45
```

```
                                        9.      PROGRAM DESCRIPTION

                                                THIS PROGRAM CONSISTS OF 64 (DECIMAL) TESTS
                                                THAT CHECK, IN INDIVIDUAL TEST LOOPS, CHARACTER LENGTH
                                                SELECTION FOR EACH LINE AT EACH LENGTH OF 5,6,7, OR 8
                                                BITS PER CHARACTER.

                                                A CHARACTER CODE OF 377 IS TRANSMITTED
                                                ON A EACH LINE
                                                AT 5,6,7, AND 8 BITS PER CHARACTER.  THE RECEIVED CHARACTER
                                                IS CHECKED TO VERIFY THAT THE DATA IS CORRECT
                                                (A CODE OF 37, 77, 177, OR 377 IF THE LENGTH IS 5,6,7, OR
                                                8 BITS, RESPECTIVELY), AND THAT THE RECEIVED
                                                LINE NUMBER AND CHARACTER STATUS INFORMATION ARE CORRECT.

                                        10.     LISTING

                                        !

                                        ;DH11 CHARACTER LENGTH AND BASIC DATA TEST
                                        ;COPYRIGHT 1972, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754

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


                                        ;SWITCH REGISTER OPTIONS

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

```
   507                                          ;ADDRESS AFTER PROGRAM RESTART
```

```
                                ;REGISTER DEFINITIONS

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

                                ;LOCATION EQUIVALENCIES

177570                          SWR=177570      ;CONSOLE SWITCH REGISTER
177570                          LIGHTS=177570   ;PDP-11/45 DISPLAY REGISTER
177776                          PS=177776       ;PROCESSOR STATUS WORD
016620                          STACK=ENDCOD+200;START OF PROCESSOR STACK

                                ;INSTRUCTION DEFINITIONS

005746                          PUSH1SP=5746    ;DECREMENT PROCESSOR STACK 1 WORD
005726                          POP1SP=5726     ;INCREMENT PROCESSOR STACK 1 WORD
010046                          PUSHR0=10046    ;SAVE R0 ON STACK
012600                          POPR0=12600     ;RESTORE R0 FROM STACK
024646                          PUSH2SP=24646   ;DECREMENT STACK TWICE
022626                          POP2SP=22626    ;INCREMENT STACK TWICE
                                .EQUIV  EMT,HLT ;BASIC DEFINITION OF ERROR CALL


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

```
                                        ;TRAP CATCHER FOR ILLEGAL INTERRUPTS
                    000000      .=0
000000  000002              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000002  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000004  000006              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000006  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000010  000012              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000012  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000014  000016              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000016  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000020  000022              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000022  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000024  000026              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000026  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000030  000032              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000032  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000034  000036              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000036  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000040  000042              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000042  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000044  000046              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000046  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000050  000052              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000052  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000054  000056              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000056  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000060  000062              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000062  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000064  000066              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000066  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000070  000072              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000072  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000074  000076              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000076  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000100  000102              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000102  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000104  000106              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000106  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000110  000112              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000112  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000114  000116              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000116  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000120  000122              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000122  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000124  000126              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000126  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000130  000132              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000132  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000134  000136              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000136  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000140  000142              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000142  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000144  000146              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000146  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
000150  000152              .+2             ;UNEXPECTED TRAP TO THIS LOCATION
000152  000000              HALT            ;EXAMINE STACK TO FIND CAUSE
```

```
   611  000154  000156                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   612  000156  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   613  000160  000162                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   614  000162  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   615  000164  000166                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   616  000166  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   617  000170  000172                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   618  000172  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   619  000174  000176                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   620  000176  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   621  000200  000202                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   622  000202  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   623  000204  000206                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   624  000206  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   625  000210  000212                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   626  000212  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   627  000214  000216                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   628  000216  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   629  000220  000222                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   630  000222  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   631  000224  000226                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   632  000226  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   633  000230  000232                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   634  000232  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   635  000234  000236                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   636  000236  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   637  000240  000242                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   638  000242  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   639  000244  000246                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   640  000246  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   641  000250  000252                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   642  000252  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   643  000254  000256                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   644  000256  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   645  000260  000262                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   646  000262  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   647  000264  000266                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   648  000266  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   649  000270  000272                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   650  000272  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   651  000274  000276                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   652  000276  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   653  000300  000302                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   654  000302  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   655  000304  000306                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   656  000306  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   657  000310  000312                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   658  000312  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   659  000314  000316                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   660  000316  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   661  000320  000322                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   662  000322  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   663  000324  000326                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   664  000326  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
   665  000330  000332                    .+2             ;UNEXPECTED TRAP TO THIS LOCATION
   666  000332  000000                    HALT            ;EXAMINE STACK TO FIND CAUSE
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   667  000334  000336                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   668  000336  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   669  000340  000342                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   670  000342  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   671  000344  000346                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   672  000346  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   673  000350  000352                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   674  000352  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   675  000354  000356                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   676  000356  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   677  000360  000362                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   678  000362  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   679  000364  000366                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   680  000366  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   681  000370  000372                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   682  000372  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   683  000374  000376                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   684  000376  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   685  000400  000402                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   686  000402  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   687  000404  000406                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   688  000406  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   689  000410  000412                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   690  000412  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   691  000414  000416                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   692  000416  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   693  000420  000422                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   694  000422  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   695  000424  000426                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   696  000426  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   697  000430  000432                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   698  000432  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   699  000434  000436                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   700  000436  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   701  000440  000442                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   702  000442  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   703  000444  000446                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   704  000446  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   705  000450  000452                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   706  000452  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   707  000454  000456                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   708  000456  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   709  000460  000462                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   710  000462  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   711  000464  000466                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   712  000466  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   713  000470  000472                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   714  000472  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   715  000474  000476                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   716  000476  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   717  000500  000502                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   718  000502  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   719  000504  000506                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   720  000506  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   721  000510  000512                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   722  000512  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
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   723  000514  000516                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   724  000516  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   725  000520  000522                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   726  000522  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   727  000524  000526                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   728  000526  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   729  000530  000532                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   730  000532  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   731  000534  000536                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   732  000536  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   733  000540  000542                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   734  000542  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   735  000544  000546                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   736  000546  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   737  000550  000552                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   738  000552  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   739  000554  000556                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   740  000556  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   741  000560  000562                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   742  000562  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   743  000564  000566                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   744  000566  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   745  000570  000572                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   746  000572  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   747  000574  000576                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   748  000576  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   749  000600  000602                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   750  000602  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   751  000604  000606                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   752  000606  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   753  000610  000612                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   754  000612  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   755  000614  000616                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   756  000616  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   757  000620  000622                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   758  000622  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   759  000624  000626                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   760  000626  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   761  000630  000632                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   762  000632  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   763  000634  000636                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   764  000636  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   765  000640  000642                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   766  000642  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   767  000644  000646                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   768  000646  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   769  000650  000652                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   770  000652  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   771  000654  000656                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   772  000656  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   773  000660  000662                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   774  000662  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   775  000664  000666                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   776  000666  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   777  000670  000672                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   778  000672  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
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```
   779  000674  000676                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   780  000676  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   781  000700  000702                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   782  000702  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   783  000704  000706                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   784  000706  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   785  000710  000712                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   786  000712  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   787  000714  000716                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   788  000716  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   789  000720  000722                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   790  000722  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   791  000724  000726                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   792  000726  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   793  000730  000732                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   794  000732  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   795  000734  000736                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   796  000736  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   797  000740  000742                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   798  000742  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   799  000744  000746                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   800  000746  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   801  000750  000752                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   802  000752  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   803  000754  000756                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   804  000756  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   805  000760  000762                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   806  000762  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   807  000764  000766                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   808  000766  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   809  000770  000772                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   810  000772  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
   811  000774  000776                    .+2          ;UNEXPECTED TRAP TO THIS LOCATION
   812  000776  000000                    HALT         ;EXAMINE STACK TO FIND CAUSE
```

```
                                        ;STANDARD INTERRUPT VECTORS


                    000024          .=24
000024  015622                      PFAIL                   ;POWER FAIL HANDLER
000026  000340                      340                     ;SERVICE AT LEVEL 7
000030  014464                      ERRORS                  ;ERROR HANDLER
000032  000340                      340                     ;SERVICE AT LEVEL 7
000034  014666                      TRPSRV                  ;GENERAL HANDLER DISPATCH SERVICE
000036  000340                      340                     ;SERVICE AT LEVEL 7
                    000200          .=200
000200  000167  000574              JMP     START           ;GO TO START OF PROGRAM


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

                    104400              SCOPE=TRAP+Y            ;SCOPE LOOP AND ITERATION HANDLER
                    104401              TYPE=TRAP+Y             ;TELETYPE OUTPUT ROUTINE
                    104402              OCTASC=TRAP+Y           ;OCTAL TO ASCII CONVERSION
                    104403              INSTR=TRAP+Y            ;INPUT ASCII STRING
                    104404              INSTER=TRAP+Y           ;STRING INPUT ERROR
                    104405              PARAM=TRAP+Y            ;CONVERT STRING TO OCTAL, CHECK LIMITS
                    104406              SAVOSP=TRAP+Y           ;SAVE R0-R5, PC
                    104407              RESOS=TRAP+Y            ;RESTORE R0-R5
                    104410              SCOPE1=TRAP+Y           ;CHECK FOR FREEZE ON CURRENT DATA
                    000046          .=46
000046  014332                      LOGICAL
                    000052          .=52
000052  040000                      40000
```

```
 845            001000                  .=1000
 846
 847                                    ;PROGRAM INITIALIZATION
 848                                    ;LOCK OUT INTERRUPTS
 849                                    ;SET UP PROCESSOR STACK
 850                                    ;SET UP POWER FAIL VECTOR
 851                                    ;CLEAR PROGRAM FLAGS AND COUNTS
 852                                    ;TYPE TITLE MESSAGE
 853
 854  001000  012767  000340  176770  START:  MOV     #340,PS                 ;LOCK OUT INTERRUPTS
 855  001006  012706  016620                  MOV     #STACK,SP               ;SET UP PROCESSOR STACK
 856  001012  012737  015622  000024          MOV     #PFAIL,@#24             ;SET UP POWER FAIL TRAP
 857  001020  005067  014570                  CLR     STFLG                   ;CLEAR TEST START FLAG
 858  001024  005067  014524                  CLR     PASCNT                  ;CLEAR PASS COUNT
 859  001030  005067  014522                  CLR     ERRCNT                  ;CLEAR ERROR COUNT
 860  001034  005067  014512                  CLR     ERRFLG                  ;CLEAR ERROR FLAG
 861  001040  005067  014506                  CLR     ERRFLG                  ;CLEAR LAST ERROR PC
 862  001044  104401  015766                  TYPE    ,MTITLE                 ;TYPE TITLE MESSAGE
 863  001050  005767  014536                  TST     INIFLG                  ;CHECK INITIALIZATION FLAG
 864  001054  001001                          BNE     VEC1                    ;IF NOT 0, CHECK SWITCHES
 865                                                                          ;FOR REINITIALIZATION
 866  001056  000404                          BR      VEC2
 867  001060  032767  000001  176502  VEC1:   BIT     #SW00,SWR               ;IF SW00=1, GET NEW VECTOR
 868  001066  001445                          BEQ     BEGIN                   ;AND CSR
 869  001070  012701  000300          VEC2:   MOV     #300,R1
 870  001074  012702  000302                  MOV     #302,R2
 871  001100  012703  000004                  MOV     #4,R3
 872  001104  010211                  1$:     MOV     R2,(R1)                 ;RESTORE TRAPCATCHER
 873  001106  005012                          CLR     (R2)                    ;IN FLOATING VECTOR AREA
 874  001110  060301                          ADD     R3,R1
 875  001112  060302                          ADD     R3,R2
 876  001114  020127  001000                  CMP     R1,#1000
 877  001120  001371                          BNE     1$
 878  001122  104403                          INSTR                           ;INPUT ADDRESS OF DEVICE VECTOR
 879  001124  016046                          MVECTOR                         ;MESSAGE "VECTOR ADDRESS-"
 880  001126  104405                          PARAM.                          ;CONVERT STRING TO OCTAL
 881  001130  000300                          300                             ;LOW LIMIT
 882  001132  000770                          770                             ;HIGH  LIMIT
 883  001134  015542                          DHRVEC                          ;LOCATIONS TO BE FILLED
 884  001136     003                  .BYTE   3                               ;NUMBER OF LOCATIONS
 885  001137     004                  .BYTE   4                               ;LSB MASK
 886  001140  104403                          INSTR                           ;INPUT ADDRESS OF DEVICE CSR
 887  001142  016070                          MREGAD                          ;MESSAGE "CONTROL REGISTER ADDRESS-"
 888  001144  104405                          PARAM                           ;CONVERT STRING TO OCTAL
 889  001146  000000                          0                               ;LOW LIMIT
 890  001150  177776                          177776                          ;HIGH LIMIT
 891  001152  015520                          DHSCR                           ;LOCATIONS TO BE FILLED
 892  001154     007                  .BYTE   7                               ;NUMBER OF LOCATIONS
 893  001155     010                  .BYTE   10                              ;LSB MASK
 894  001156  016767  014354  014354          MOV     DHSSR,DHSLR             ;SET UP ADDRESS OF SILO
 895  001164  005267  014350                  INC     DHSLR                   ;STATUS REGISTER HIGH BYTE
 896  001170  005767  014416                  TST     INIFLG                  ;IF INITIALIZATION FLAG
 897  001174  001002                          BNE     BEGIN                   ;IS CLEARED
 898  001176  005167  014410                  COM     INIFLG                  ;SET IT
 899
 900                                    ;PROGRAM START
```

```
                                                ;CHECK FOR PROGRAM START AT SELECTED ADDRESS
                                                
001202  012767  000340  176566  BEGIN:  MOV     #340,PS                 ;LOCK OUT INTERRUPTS
001210  012706  016620                  MOV     #STACK,SP               ;SET UP PROCESSOR STACK
001214  032767  000002  176346          BIT     #SW01,SWR               ;IF SW01=1
001222  001410                          BEQ     1$                      ;GET PC FOR PROGRAM START
001224  104403                          INSTR                           ;GET PC
001226  016234                          MTSTPC                          ;MESSAGE "TEST PC"
001230  104405                          PARAM                           ;CONVERT STRING TO OCTAL
001232  000000                          0
001234  017500                          17500
001236  000207                          RETURN
001240     001                  .BYTE   1
001241     001                  .BYTE   1
001242  000410                          BR      2$
001244  012767  001274  014306  1$:     MOV     #T1,RETURN              ;NORMAL START, TEST 1
001252  005767  014336                  TST     STFLG                   ;IF LOOPING, BYPASS TYPEOUT
001256  001004                          BNE     3$
001260  005167  014330                  COM     STFLG
001264  104401  016230          2$:     TYPE    ,MR                     ;TYPE "R" TO INDICATE START
001270  000177  014264          3$:     JMP     @RETURN                 ;START TESTING
```

```
                                        ;CHARACTER LENGTH TEST
                                        ;TRANSMIT 1 CHARACTER ON LINE 0
                                        ;CHARACTER LENGTH IS 5 BITS
                                        ;EXPECTED RECEIVED CHARACTER IS 37
                                        ;LINE SPEED IS 9600 BAUD

001274  012767  000340  176474  T1:   MOV     #340,PS           ;DISABLE ALL INTERRUPTS
001302  012767  000400  014256        MOV     #400,ICOUNT       ;SET UP FOR 400 ITERATIONS
001310  012767  001422  014244        MOV     #2$,ESCAPE        ;SET UP TO ESCAPE TO NEXT TEST
001316  012777  004000  014174        MOV     #BIT11,@DHSCR     ;MASTER CLEAR INTERFACE
001324  012767  000037  014266        MOV     #37,TDATA         ;CHARACTER TO BE TRANSMITTED = 37(OCTAL)
001332  012777  000000  014160        MOV     #0,@DHSCR         ;SELECT LINE 0
001340  012777  177777  014162        MOV     #-1,@DHBC         ;SET UP TO TRANSMIT 1 BYTE
001346  012777  015620  014152        MOV     #TDATA,@DHBA      ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
001354  012777  033500  014142        MOV     #33500,@DHLPR     ;SET LINE SPEED FOR 9600 BAUD
001362  052777  000000  014134        BIS     #0,@DHLPR         ;SET CHARACTER LENGTH FOR 5 BITS
001370  012777  000001  014134        MOV     #1,@DHBAR         ;START TRANSMITTER
001376  105777  014116          1$:   TSTB    @DHSCR            ;WAIT TO RECEIVE CHARACTER
001402  100375                        BPL     1$
001404  017704  014112                MOV     @DHNRC,R4         ;(R4)=RECEIVED CHARACTER
                                                                ;IN LOW BYTE, AND LINE NUMBER AND
                                                                ;CHARACTER STATUS IN HIGH BYTE
001410  012705  100037                MOV     #100037,R5        ;(R5)=EXPECTED CHARACTER IN LOW BYTE
                                                                ;AND LINE NUMBER AND CHARACTER
                                                                ;STATUS IN HIGH BYTE
001414  020504                        CMP     R5,R4             ;ARE EXPECTED AND RECEIVED DATA THE SAME
001416  001401                        BEQ     2$
001420  104000                        HLT                       ;CHARACTER LENGTH, DATA
                                                                ;OR LINE NUMBER ERROR
001422  104400                2$:   SCOPE

                                        ;CHARACTER LENGTH TEST
                                        ;TRANSMIT 1 CHARACTER ON LINE 0
                                        ;CHARACTER LENGTH IS 6 BITS
                                        ;EXPECTED RECEIVED CHARACTER IS 77
                                        ;LINE SPEED IS 9600 BAUD

001424  012767  000340  176344  T2:   MOV     #340,PS           ;DISABLE ALL INTERRUPTS
001432  012767  000400  014126        MOV     #400,ICOUNT       ;SET UP FOR 400 ITERATIONS
001440  012767  001552  014114        MOV     #2$,ESCAPE        ;SET UP TO ESCAPE TO NEXT TEST
001446  012777  004000  014044        MOV     #BIT11,@DHSCR     ;MASTER CLEAR INTERFACE
001454  012767  000077  014136        MOV     #77,TDATA         ;CHARACTER TO BE TRANSMITTED = 77(OCTAL)
001462  012777  000000  014030        MOV     #0,@DHSCR         ;SELECT LINE 0
001470  012777  177777  014032        MOV     #-1,@DHBC         ;SET UP TO TRANSMIT 1 BYTE
001476  012777  015620  014022        MOV     #TDATA,@DHBA      ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
001504  012777  033500  014012        MOV     #33500,@DHLPR     ;SET LINE SPEED FOR 9600 BAUD
001512  052777  000001  014004        BIS     #1,@DHLPR         ;SET CHARACTER LENGTH FOR 6 BITS
001520  012777  000001  014004        MOV     #1,@DHBAR         ;START TRANSMITTER
001526  105777  013766          1$:   TSTB    @DHSCR            ;WAIT TO RECEIVE CHARACTER
001532  100375                        BPL     1$
001534  017704  013762                MOV     @DHNRC,R4         ;(R4)=RECEIVED CHARACTER
                                                                ;IN LOW BYTE, AND LINE NUMBER AND
                                                                ;CHARACTER STATUS IN HIGH BYTE
001540  012705  100077                MOV     #100077,R5        ;(R5)=EXPECTED CHARACTER IN LOW BYTE
                                                                ;AND LINE NUMBER AND CHARACTER
```

```
                                                                        ;STATUS IN HIGH BYTE
001544  020504                        CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
001546  001401                        BEQ     2$
001550  104000                        HLT                             ;CHARACTER LENGTH, DATA
                                                                        ;OR LINE NUMBER ERROR
001552  104400                2$:     SCOPE

                                    ;CHARACTER LENGTH TEST
                                    ;TRANSMIT 1 CHARACTER ON LINE 0
                                    ;CHARACTER LENGTH IS 7 BITS
                                    ;EXPECTED RECEIVED CHARACTER IS 177
                                    ;LINE SPEED IS 9600 BAUD

001554  012767  000340  176214  T3:   MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
001562  012767  000400  013776        MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
001570  012767  001702  013764        MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
001576  012777  004000  013714        MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
001604  012767  000177  014006        MOV     #177,TDATA              ;CHARACTER TO BE TRANSMITTED = 177(OCTAL)
001612  012777  000000  013700        MOV     #0,@DHSCR               ;SELECT LINE 0
001620  012777  177777  013702        MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
001626  012777  015620  013672        MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
001634  012777  033500  013662        MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
001642  052777  000002  013654        BIS     #2,@DHLPR               ;SET CHARACTER LENGTH FOR 7 BITS
001650  012777  000001  013654        MOV     #1,@DHBAR               ;START TRANSMITTER
001656  105777  013636          1$:   TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
001662  100375                        BPL     1$
001664  017704  013632                MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
                                                                        ;IN LOW BYTE, AND LINE NUMBER AND
                                                                        ;CHARACTER STATUS IN HIGH BYTE
001670  012705  100177                MOV     #100177,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
                                                                        ;AND LINE NUMBER AND CHARACTER
                                                                        ;STATUS IN HIGH BYTE
001674  020504                        CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
001676  001401                        BEQ     2$
001700  104000                        HLT                             ;CHARACTER LENGTH, DATA
                                                                        ;OR LINE NUMBER ERROR
001702  104400                2$:     SCOPE

                                    ;CHARACTER LENGTH TEST
                                    ;TRANSMIT 1 CHARACTER ON LINE 0
                                    ;CHARACTER LENGTH IS 10 BITS
                                    ;EXPECTED RECEIVED CHARACTER IS 377
                                    ;LINE SPEED IS 9600 BAUD

001704  012767  000340  176064  T4:   MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
001712  012767  000400  013646        MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
001720  012767  002032  013634        MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
001726  012777  004000  013564        MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
001734  012767  000377  013656        MOV     #377,TDATA              ;CHARACTER TO BE TRANSMITTED = 377(OCTAL)
001742  012777  000000  013550        MOV     #0,@DHSCR               ;SELECT LINE 0
001750  012777  177777  013552        MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
001756  012777  015620  013542        MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
001764  012777  033500  013532        MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
001772  052777  000003  013524        BIS     #3,@DHLPR               ;SET CHARACTER LENGTH FOR 10 BITS
002000  012777  000001  013524        MOV     #1,@DHBAR               ;START TRANSMITTER
002006  105777  013506          1$:   TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
```

```
1034  002012  100375                          BPL     1$
1035  002014  017704  013502                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
1036                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
1037                                                                          ;CHARACTER STATUS IN HIGH BYTE
1038  002020  012705  100377                  MOV     #100377,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1039                                                                          ;AND LINE NUMBER AND CHARACTER
1040                                                                          ;STATUS IN HIGH BYTE
1041  002024  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
1042  002026  001401                          BEQ     2$
1043  002030  104000                          HLT                             ;CHARACTER LENGTH, DATA
1044                                                                          ;OR LINE NUMBER ERROR
1045  002032  104400                  2$:     SCOPE
1046
1047                                          ;CHARACTER LENGTH TEST
1048                                          ;TRANSMIT 1 CHARACTER ON LINE 1
1049                                          ;CHARACTER LENGTH IS 5 BITS
1050                                          ;EXPECTED RECEIVED CHARACTER IS 37
1051                                          ;LINE SPEED IS 9600 BAUD
1052
1053  002034  012767  000340  175734  T5:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1054  002042  012767  000400  013516          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
1055  002050  012767  002162  013504          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1056  002056  012777  004000  013434          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1057  002064  012767  000037  013526          MOV     #37,TDATA               ;CHARACTER TO BE TRANSMITTED = 37(OCTAL)
1058  002072  012777  000001  013420          MOV     #1,@DHSCR               ;SELECT LINE 1
1059  002100  012777  177777  013422          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
1060  002106  012777  015620  013412          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1061  002114  012777  033500  013402          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
1062  002122  052777  000000  013374          BIS     #0,@DHLPR               ;SET CHARACTER LENGTH FOR 5 BITS
1063  002130  012777  000002  013374          MOV     #2,@DHBAR               ;START TRANSMITTER
1064  002136  105777  013356          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
1065  002142  100375                          BPL     1$
1066  002144  017704  013352                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
1067                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
1068                                                                          ;CHARACTER STATUS IN HIGH BYTE
1069  002150  012705  100437                  MOV     #100437,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1070                                                                          ;AND LINE NUMBER AND CHARACTER
1071                                                                          ;STATUS IN HIGH BYTE
1072  002154  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
1073  002156  001401                          BEQ     2$
1074  002160  104000                          HLT                             ;CHARACTER LENGTH, DATA
1075                                                                          ;OR LINE NUMBER ERROR
1076  002162  104400                  2$:     SCOPE
1077
1078                                          ;CHARACTER LENGTH TEST
1079                                          ;TRANSMIT 1 CHARACTER ON LINE 1
1080                                          ;CHARACTER LENGTH IS 6 BITS
1081                                          ;EXPECTED RECEIVED CHARACTER IS 77
1082                                          ;LINE SPEED IS 9600 BAUD
1083
1084  002164  012767  000340  175604  T6:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1085  002172  012767  000400  013366          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
1086  002200  012767  002312  013354          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1087  002206  012777  004000  013304          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1088  002214  012767  000077  013376          MOV     #77,TDATA               ;CHARACTER TO BE TRANSMITTED = 77(OCTAL)
1089  002222  012777  000001  013270          MOV     #1,@DHSCR               ;SELECT LINE 1
```

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1090  002230  012777  177777  013272          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
1091  002236  012777  015620  013262          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1092  002244  012777  033500  013252          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
1093  002252  052777  000001  013244          BIS     #1,@DHLPR               ;SET CHARACTER LENGTH FOR 6 BITS
1094  002260  012777  000002  013244          MOV     #2,@DHBAR               ;START TRANSMITTER
1095  002266  105777  013226            1$:   TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
1096  002272  100375                         BPL     1$
1097  002274  017704  013222                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
1098                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
1099                                                                          ;CHARACTER STATUS IN HIGH BYTE
1100  002300  012705  100477                  MOV     #100477;R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1101                                                                          ;AND LINE NUMBER AND CHARACTER
1102                                                                          ;STATUS IN HIGH BYTE
1103  002304  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
1104  002306  001401                          BEQ     2$
1105  002310  104000                          HLT                             ;CHARACTER LENGTH, DATA
1106                                                                          ;OR LINE NUMBER ERROR
1107  002312  104400            2$:   SCOPE
1108
1109                                  ;CHARACTER LENGTH TEST
1110                                  ;TRANSMIT 1 CHARACTER ON LINE 1
1111                                  ;CHARACTER LENGTH IS 7 BITS
1112                                  ;EXPECTED RECEIVED CHARACTER IS 177
1113                                  ;LINE SPEED IS 9600 BAUD
1114
1115  002314  012767  000340  175454  T7:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1116  002322  012767  000400  013236          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
1117  002330  012767  002442  013224          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1118  002336  012777  004000  013154          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1119  002344  012767  000177  013246          MOV     #177,TDATA              ;CHARACTER TO BE TRANSMITTED = 177(OCTAL)
1120  002352  012777  000001  013140          MOV     #1,@DHSCR               ;SELECT LINE 1
1121  002360  012777  177777  013142          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
1122  002366  012777  015620  013132          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1123  002374  012777  033500  013122          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
1124  002402  052777  000002  013114          BIS     #2,@DHLPR               ;SET CHARACTER LENGTH FOR 7 BITS
1125  002410  012777  000002  013114          MOV     #2,@DHBAR               ;START TRANSMITTER
1126  002416  105777  013076            1$:   TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
1127  002422  100375                         BPL     1$
1128  002424  017704  013072                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
1129                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
1130                                                                          ;CHARACTER STATUS IN HIGH BYTE
1131  002430  012705  100577                  MOV     #100577,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1132                                                                          ;AND LINE NUMBER AND CHARACTER
1133                                                                          ;STATUS IN HIGH BYTE
1134  002434  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
1135  002436  001401                          BEQ     2$
1136  002440  104000                          HLT                             ;CHARACTER LENGTH, DATA
1137                                                                          ;OR LINE NUMBER ERROR
1138  002442  104400            2$:   SCOPE
1139
1140                                  ;CHARACTER LENGTH TEST
1141                                  ;TRANSMIT 1 CHARACTER ON LINE 1
1142                                  ;CHARACTER LENGTH IS 10 BITS
1143                                  ;EXPECTED RECEIVED CHARACTER IS 377
1144                                  ;LINE SPEED IS 9600 BAUD
1145
```

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1146  002444  012767  000340  175324  T10:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1147  002452  012767  000400  013106          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
1148  002460  012767  002572  013074          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1149  002466  012777  004000  013024          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1150  002474  012767  000377  013116          MOV     #377,TDATA              ;CHARACTER TO BE TRANSMITTED = 377(OCTAL)
1151  002502  012777  000001  013010          MOV     #1,@DHSCR               ;SELECT LINE 1
1152  002510  012777  177777  013012          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
1153  002516  012777  015620  013002          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1154  002524  012777  033500  012772          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
1155  002532  052777  000003  012764          BIS     #3,@DHLPR               ;SET CHARACTER LENGTH FOR 10 BITS
1156  002540  012777  000002  012764          MOV     #2,@DHBAR               ;START TRANSMITTER
1157  002546  105777  012746          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
1158  002552  100375                          BPL     1$
1159  002554  017704  012742                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
1160                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
1161                                                                          ;CHARACTER STATUS IN HIGH BYTE
1162  002560  012705  100777                  MOV     #100777,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1163                                                                          ;AND LINE NUMBER AND CHARACTER
1164                                                                          ;STATUS IN HIGH BYTE
1165  002564  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
1166  002566  001401                          BEQ     2$
1167  002570  104000                          HLT                             ;CHARACTER LENGTH, DATA
1168                                                                          ;OR LINE NUMBER ERROR
1169  002572  104400                  2$:     SCOPE
1170
1171                                          ;CHARACTER LENGTH TEST
1172                                          ;TRANSMIT 1 CHARACTER ON LINE 2
1173                                          ;CHARACTER LENGTH IS 5 BITS
1174                                          ;EXPECTED RECEIVED CHARACTER IS 37
1175                                          ;LINE SPEED IS 9600 BAUD
1176
1177  002574  012767  000340  175174  T11:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1178  002602  012767  000400  012756          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
1179  002610  012767  002722  012744          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1180  002616  012777  004000  012674          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1181  002624  012767  000037  012766          MOV     #37,TDATA               ;CHARACTER TO BE TRANSMITTED = 37(OCTAL)
1182  002632  012777  000002  012660          MOV     #2,@DHSCR               ;SELECT LINE 2
1183  002640  012777  177777  012662          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
1184  002646  012777  015620  012652          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1185  002654  012777  033500  012642          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
1186  002662  052777  000000  012634          BIS     #0,@DHLPR               ;SET CHARACTER LENGTH FOR 5 BITS
1187  002670  012777  000004  012634          MOV     #4,@DHBAR               ;START TRANSMITTER
1188  002676  105777  012616          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
1189  002702  100375                          BPL     1$
1190  002704  017704  012612                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
1191                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
1192                                                                          ;CHARACTER STATUS IN HIGH BYTE
1193  002710  012705  101037                  MOV     #101037,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1194                                                                          ;AND LINE NUMBER AND CHARACTER
1195                                                                          ;STATUS IN HIGH BYTE
1196  002714  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
1197  002716  001401                          BEQ     2$
1198  002720  104000                          HLT                             ;CHARACTER LENGTH, DATA
1199                                                                          ;OR LINE NUMBER ERROR
1200  002722  104400                  2$:     SCOPE
1201
```

```
1202                                            ;CHARACTER LENGTH TEST
1203                                            ;TRANSMIT 1 CHARACTER ON LINE 2
1204                                            ;CHARACTER LENGTH IS 6 BITS
1205                                            ;EXPECTED RECEIVED CHARACTER IS 77
1206                                            ;LINE SPEED IS 9600 BAUD
1207
1208  002724  012767  000340  175044  T12:    MOV     #340,PS         ;DISABLE ALL INTERRUPTS
1209  002732  012767  000400  012626          MOV     #400,ICOUNT     ;SET UP FOR 400 ITERATIONS
1210  002740  012767  003052  012614          MOV     #2$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
1211  002746  012777  004000  012544          MOV     #BIT11,@DHSCR   ;MASTER CLEAR INTERFACE
1212  002754  012767  000077  012636          MOV     #77,TDATA       ;CHARACTER TO BE TRANSMITTED = 77(OCTAL)
1213  002762  012777  000002  012530          MOV     #2,@DHSCR       ;SELECT LINE 2
1214  002770  012777  177777  012532          MOV     #-1,@DHBC       ;SET UP TO TRANSMIT 1 BYTE
1215  002776  012777  015620  012522          MOV     #TDATA,@DHBA    ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1216  003004  012777  033500  012512          MOV     #33500,@DHLPR   ;SET LINE SPEED FOR 9600 BAUD
1217  003012  052777  000001  012504          BIS     #1,@DHLPR       ;SET CHARACTER LENGTH FOR 6 BITS
1218  003020  012777  000004  012504          MOV     #4,@DHBAR       ;START TRANSMITTER
1219  003026  105777  012466          1$:     TSTB    @DHSCR          ;WAIT TO RECEIVE CHARACTER
1220  003032  100375                          BPL     1$
1221  003034  017704  012462                  MOV     @DHNRC,R4       ;(R4)=RECEIVED CHARACTER
1222                                                                  ;IN LOW BYTE, AND LINE NUMBER AND
1223                                                                  ;CHARACTER STATUS IN HIGH BYTE
1224  003040  012705  101077                  MOV     #101077,R5      ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1225                                                                  ;AND LINE NUMBER AND CHARACTER
1226                                                                  ;STATUS IN HIGH BYTE
1227  003044  020504                          CMP     R5,R4           ;ARE EXPECTED AND RECEIVED DATA THE SAME
1228  003046  001401                          BEQ     2$
1229  003050  104000                          HLT                     ;CHARACTER LENGTH, DATA
1230                                                                  ;OR LINE NUMBER ERROR
1231  003052  104400                  2$:     SCOPE
1232
1233                                            ;CHARACTER LENGTH TEST
1234                                            ;TRANSMIT 1 CHARACTER ON LINE 2
1235                                            ;CHARACTER LENGTH IS 7 BITS
1236                                            ;EXPECTED RECEIVED CHARACTER IS 177
1237                                            ;LINE SPEED IS 9600 BAUD
1238
1239  003054  012767  000340  174714  T13:    MOV     #340,PS         ;DISABLE ALL INTERRUPTS
1240  003062  012767  000400  012476          MOV     #400,ICOUNT     ;SET UP FOR 400 ITERATIONS
1241  003070  012767  003202  012464          MOV     #2$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
1242  003076  012777  004000  012414          MOV     #BIT11,@DHSCR   ;MASTER CLEAR INTERFACE
1243  003104  012767  000177  012506          MOV     #177,TDATA      ;CHARACTER TO BE TRANSMITTED = 177(OCTAL)
1244  003112  012777  000002  012400          MOV     #2,@DHSCR       ;SELECT LINE 2
1245  003120  012777  177777  012402          MOV     #-1,@DHBC       ;SET UP TO TRANSMIT 1 BYTE
1246  003126  012777  015620  012372          MOV     #TDATA,@DHBA    ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1247  003134  012777  033500  012362          MOV     #33500,@DHLPR   ;SET LINE SPEED FOR 9600 BAUD
1248  003142  052777  000002  012354          BIS     #2,@DHLPR       ;SET CHARACTER LENGTH FOR 7 BITS
1249  003150  012777  000004  012354          MOV     #4,@DHBAR       ;START TRANSMITTER
1250  003156  105777  012336          1$:     TSTB    @DHSCR          ;WAIT TO RECEIVE CHARACTER
1251  003162  100375                          BPL     1$
1252  003164  017704  012332                  MOV     @DHNRC,R4       ;(R4)=RECEIVED CHARACTER
1253                                                                  ;IN LOW BYTE, AND LINE NUMBER AND
1254                                                                  ;CHARACTER STATUS IN HIGH BYTE
1255  003170  012705  101177                  MOV     #101177,R5      ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1256                                                                  ;AND LINE NUMBER AND CHARACTER
1257                                                                  ;STATUS IN HIGH BYTE
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1258  003174  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
1259  003176  001401                          BEQ     2$
1260  003200  104000                          HLT                             ;CHARACTER LENGTH, DATA
1261                                                                          ;OR LINE NUMBER ERROR
1262  003202  104400                  2$:     SCOPE
1263
1264                                          ;CHARACTER LENGTH TEST
1265                                          ;TRANSMIT 1 CHARACTER ON LINE 2
1266                                          ;CHARACTER LENGTH IS 10 BITS
1267                                          ;EXPECTED RECEIVED CHARACTER IS 377
1268                                          ;LINE SPEED IS 9600 BAUD
1269
1270  003204  012767  000340  174564  T14:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1271  003212  012767  000400  012346          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
1272  003220  012767  003332  012334          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1273  003226  012777  004000  012264          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1274  003234  012767  000377  012356          MOV     #377,TDATA              ;CHARACTER TO BE TRANSMITTED = 377(OCTAL)
1275  003242  012777  000002  012250          MOV     #2,@DHSCR               ;SELECT LINE 2
1276  003250  012777  177777  012252          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
1277  003256  012777  015620  012242          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1278  003264  012777  033500  012232          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
1279  003272  052777  000003  012224          BIS     #3,@DHLPR               ;SET CHARACTER LENGTH FOR 10 BITS
1280  003300  012777  000004  012224          MOV     #4,@DHBAR               ;START TRANSMITTER
1281  003306  105777  012206          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
1282  003312  100375                          BPL     1$
1283  003314  017704  012202                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
1284                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
1285                                                                          ;CHARACTER STATUS IN HIGH BYTE
1286  003320  012705  101377                  MOV     #101377,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1287                                                                          ;AND LINE NUMBER AND CHARACTER
1288                                                                          ;STATUS IN HIGH BYTE
1289  003324  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
1290  003326  001401                          BEQ     2$
1291  003330  104000                          HLT                             ;CHARACTER LENGTH, DATA
1292                                                                          ;OR LINE NUMBER ERROR
1293  003332  104400                  2$:     SCOPE
1294
1295                                          ;CHARACTER LENGTH TEST
1296                                          ;TRANSMIT 1 CHARACTER ON LINE 3
1297                                          ;CHARACTER LENGTH IS 5 BITS
1298                                          ;EXPECTED RECEIVED CHARACTER IS 37
1299                                          ;LINE SPEED IS 9600 BAUD
1300
1301  003334  012767  000340  174434  T15:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1302  003342  012767  000400  012216          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
1303  003350  012767  003462  012204          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1304  003356  012777  004000  012134          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1305  003364  012767  000037  012226          MOV     #37,TDATA               ;CHARACTER TO BE TRANSMITTED = 37(OCTAL)
1306  003372  012777  000003  012120          MOV     #3,@DHSCR               ;SELECT LINE 3
1307  003400  012777  177777  012122          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
1308  003406  012777  015620  012112          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1309  003414  012777  033500  012102          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
1310  003422  052777  000000  012074          BIS     #0,@DHLPR               ;SET CHARACTER LENGTH FOR 5 BITS
1311  003430  012777  000010  012074          MOV     #10,@DHBAR              ;START TRANSMITTER
1312  003436  105777  012056          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
1313  003442  100375                          BPL     1$
```

```
1314  003444  017704  012052                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
1315                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
1316                                                                          ;CHARACTER STATUS IN HIGH BYTE
1317  003450  012705  101437                  MOV     #101437,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1318                                                                          ;AND LINE NUMBER AND CHARACTER
1319                                                                          ;STATUS IN HIGH BYTE
1320  003454  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
1321  003456  001401                          BEQ     2$
1322  003460  104000                          HLT                             ;CHARACTER LENGTH, DATA
1323                                                                          ;OR LINE NUMBER ERROR
1324  003462  104400                  2$:     SCOPE
1325
1326                                          ;CHARACTER LENGTH TEST
1327                                          ;TRANSMIT 1 CHARACTER ON LINE 3
1328                                          ;CHARACTER LENGTH IS 6 BITS
1329                                          ;EXPECTED RECEIVED CHARACTER IS 77
1330                                          ;LINE SPEED IS 9600 BAUD
1331
1332  003464  012767  000340  174304  T16:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1333  003472  012767  000400  012066          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
1334  003500  012767  003612  012054          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1335  003506  012777  004000  012004          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1336  003514  012767  000077  012076          MOV     #77,TDATA               ;CHARACTER TO BE TRANSMITTED = 77(OCTAL)
1337  003522  012777  000003  011770          MOV     #3,@DHSCR               ;SELECT LINE 3
1338  003530  012777  177777  011772          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
1339  003536  012777  015620  011762          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1340  003544  012777  033500  011752          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
1341  003552  052777  000001  011744          BIS     #1,@DHLPR               ;SET CHARACTER LENGTH FOR 6 BITS
1342  003560  012777  000010  011744          MOV     #10,@DHBAR              ;START TRANSMITTER
1343  003566  105777  011726          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
1344  003572  100375                          BPL     1$
1345  003574  017704  011722                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
1346                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
1347                                                                          ;CHARACTER STATUS IN HIGH BYTE
1348  003600  012705  101477                  MOV     #101477,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1349                                                                          ;AND LINE NUMBER AND CHARACTER
1350                                                                          ;STATUS IN HIGH BYTE
1351  003604  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
1352  003606  001401                          BEQ     2$
1353  003610  104000                          HLT                             ;CHARACTER LENGTH, DATA
1354                                                                          ;OR LINE NUMBER ERROR
1355  003612  104400                  2$:     SCOPE
1356
1357                                          ;CHARACTER LENGTH TEST
1358                                          ;TRANSMIT 1 CHARACTER ON LINE 3
1359                                          ;CHARACTER LENGTH IS 7 BITS
1360                                          ;EXPECTED RECEIVED CHARACTER IS 177
1361                                          ;LINE SPEED IS 9600 BAUD
1362
1363  003614  012767  000340  174154  T17:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1364  003622  012767  000400  011736          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
1365  003630  012767  003742  011724          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1366  003636  012777  004000  011654          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1367  003644  012767  000177  011746          MOV     #177,TDATA              ;CHARACTER TO BE TRANSMITTED = 177(OCTAL)
1368  003652  012777  000003  011640          MOV     #3,@DHSCR               ;SELECT LINE 3
1369  003660  012777  177777  011642          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
```

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1370  003666  012777  015620  011632          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1371  003674  012777  033500  011622          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
1372  003702  052777  000002  011614          BIS     #2,@DHLPR               ;SET CHARACTER LENGTH FOR 7 BITS
1373  003710  012777  000010  011614          MOV     #10,@DHBAR              ;START TRANSMITTER
1374  003716  105777  011576          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
1375  003722  100375                          BPL     1$
1376  003724  017704  011572                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
1377                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
1378                                                                          ;CHARACTER STATUS IN HIGH BYTE
1379  003730  012705  101577                  MOV     #101577,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1380                                                                          ;AND LINE NUMBER AND CHARACTER
1381                                                                          ;STATUS IN HIGH BYTE
1382  003734  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
1383  003736  001401                          BEQ     2$
1384  003740  104000                          HLT                             ;CHARACTER LENGTH, DATA
1385                                                                          ;OR LINE NUMBER ERROR
1386  003742  104400          2$:             SCOPE
1387
1388                                          ;CHARACTER LENGTH TEST
1389                                          ;TRANSMIT 1 CHARACTER ON LINE 3
1390                                          ;CHARACTER LENGTH IS 10 BITS
1391                                          ;EXPECTED RECEIVED CHARACTER IS 377
1392                                          ;LINE SPEED IS 9600 BAUD
1393
1394  003744  012767  000340  174024  T20:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1395  003752  012767  000400  011606          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
1396  003760  012767  004072  011574          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1397  003766  012777  004000  011524          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1398  003774  012767  000377  011616          MOV     #377,TDATA              ;CHARACTER TO BE TRANSMITTED = 377(OCTAL)
1399  004002  012777  000003  011510          MOV     #3,@DHSCR               ;SELECT LINE 3
1400  004010  012777  177777  011512          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
1401  004016  012777  015620  011502          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1402  004024  012777  033500  011472          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
1403  004032  052777  000003  011464          BIS     #3,@DHLPR               ;SET CHARACTER LENGTH FOR 10 BITS
1404  004040  012777  000010  011464          MOV     #10,@DHBAR              ;START TRANSMITTER
1405  004046  105777  011446          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
1406  004052  100375                          BPL     1$
1407  004054  017704  011442                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
1408                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
1409                                                                          ;CHARACTER STATUS IN HIGH BYTE
1410  004060  012705  101777                  MOV     #101777,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1411                                                                          ;AND LINE NUMBER AND CHARACTER
1412                                                                          ;STATUS IN HIGH BYTE
1413  004064  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
1414  004066  001401                          BEQ     2$
1415  004070  104000                          HLT                             ;CHARACTER LENGTH, DATA
1416                                                                          ;OR LINE NUMBER ERROR
1417  004072  104400          2$:             SCOPE
1418
1419                                          ;CHARACTER LENGTH TEST
1420                                          ;TRANSMIT 1 CHARACTER ON LINE 4
1421                                          ;CHARACTER LENGTH IS 5 BITS
1422                                          ;EXPECTED RECEIVED CHARACTER IS 37
1423                                          ;LINE SPEED IS 9600 BAUD
1424
1425  004074  012767  000340  173674  T21:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
```

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1426  004102  012767  000400  011456          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
1427  004110  012767  004222  011444          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1428  004116  012777  004000  011374          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1429  004124  012767  000037  011466          MOV     #37,TDATA               ;CHARACTER TO BE TRANSMITTED = 37(OCTAL)
1430  004132  012777  000004  011360          MOV     #4,@DHSCR               ;SELECT LINE 4
1431  004140  012777  177777  011362          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
1432  004146  012777  015620  011352          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1433  004154  012777  033500  011342          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
1434  004162  052777  000000  011334          BIS     #0,@DHLPR               ;SET CHARACTER LENGTH FOR 5 BITS
1435  004170  012777  000020  011334          MOV     #20,@DHBAR              ;START TRANSMITTER
1436  004176  105777  011316          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
1437  004202  100375                          BPL     1$
1438  004204  017704  011312                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
1439                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
1440                                                                          ;CHARACTER STATUS IN HIGH BYTE
1441  004210  012705  102037                  MOV     #102037,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1442                                                                          ;AND LINE NUMBER AND CHARACTER
1443                                                                          ;STATUS IN HIGH BYTE
1444  004214  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
1445  004216  001401                          BEQ     2$
1446  004220  104000                          HLT                             ;CHARACTER LENGTH, DATA
1447                                                                          ;OR LINE NUMBER ERROR
1448  004222  104400          2$:     SCOPE
1449
1450                                          ;CHARACTER LENGTH TEST
1451                                          ;TRANSMIT 1 CHARACTER ON LINE 4
1452                                          ;CHARACTER LENGTH IS 6 BITS
1453                                          ;EXPECTED RECEIVED CHARACTER IS 77
1454                                          ;LINE SPEED IS 9600 BAUD
1455
1456  004224  012767  000340  173544  T22:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1457  004232  012767  000400  011326          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
1458  004240  012767  004352  011314          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1459  004246  012777  004000  011244          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1460  004254  012767  000077  011336          MOV     #77,TDATA               ;CHARACTER TO BE TRANSMITTED = 77(OCTAL)
1461  004262  012777  000004  011230          MOV     #4,@DHSCR               ;SELECT LINE 4
1462  004270  012777  177777  011232          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
1463  004276  012777  015620  011222          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1464  004304  012777  033500  011212          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
1465  004312  052777  000001  011204          BIS     #1,@DHLPR               ;SET CHARACTER LENGTH FOR 6 BITS
1466  004320  012777  000020  011204          MOV     #20,@DHBAR              ;START TRANSMITTER
1467  004326  105777  011166          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
1468  004332  100375                          BPL     1$
1469  004334  017704  011162                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
1470                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
1471                                                                          ;CHARACTER STATUS IN HIGH BYTE
1472  004340  012705  102077                  MOV     #102077,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1473                                                                          ;AND LINE NUMBER AND CHARACTER
1474                                                                          ;STATUS IN HIGH BYTE
1475  004344  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
1476  004346  001401                          BEQ     2$
1477  004350  104000                          HLT                             ;CHARACTER LENGTH, DATA
1478                                                                          ;OR LINE NUMBER ERROR
1479  004352  104400          2$:     SCOPE
1480
1481                                          ;CHARACTER LENGTH TEST
```

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1482                                            ;TRANSMIT 1 CHARACTER ON LINE 4
1483                                            ;CHARACTER LENGTH IS 7 BITS
1484                                            ;EXPECTED RECEIVED CHARACTER IS 177
1485                                            ;LINE SPEED IS 9600 BAUD
1486
1487  004354  012767  000340  173414  T23:    MOV     #340,PS         ;DISABLE ALL INTERRUPTS
1488  004362  012767  000400  011176          MOV     #400,ICOUNT     ;SET UP FOR 400 ITERATIONS
1489  004370  012767  004502  011164          MOV     #2$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
1490  004376  012777  004000  011114          MOV     #BIT11,@DHSCR   ;MASTER CLEAR INTERFACE
1491  004404  012767  000177  011206          MOV     #177,TDATA      ;CHARACTER TO BE TRANSMITTED = 177(OCTAL)
1492  004412  012777  000004  011100          MOV     #4,@DHSCR       ;SELECT LINE 4
1493  004420  012777  177777  011102          MOV     #-1,@DHBC       ;SET UP TO TRANSMIT 1 BYTE
1494  004426  012777  015620  011072          MOV     #TDATA,@DHBA    ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1495  004434  012777  033500  011062          MOV     #33500,@DHLPR   ;SET LINE SPEED FOR 9600 BAUD
1496  004442  052777  000002  011054          BIS     #2,@DHLPR       ;SET CHARACTER LENGTH FOR 7 BITS
1497  004450  012777  000020  011054          MOV     #20,@DHBAR      ;START TRANSMITTER
1498  004456  105777  011036          1$:     TSTB    @DHSCR          ;WAIT TO RECEIVE CHARACTER
1499  004462  100375                          BPL     1$
1500  004464  017704  011032                  MOV     @DHNRC,R4       ;(R4)=RECEIVED CHARACTER
1501                                                                  ;IN LOW BYTE, AND LINE NUMBER AND
1502                                                                  ;CHARACTER STATUS IN HIGH BYTE
1503  004470  012705  102177                  MOV     #102177,R5      ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1504                                                                  ;AND LINE NUMBER AND CHARACTER
1505                                                                  ;STATUS IN HIGH BYTE
1506  004474  020504                          CMP     R5,R4           ;ARE EXPECTED AND RECEIVED DATA THE SAME
1507  004476  001401                          BEQ     2$
1508  004500  104000                          HLT                     ;CHARACTER LENGTH, DATA
1509                                                                  ;OR LINE NUMBER ERROR
1510  004502  104400          2$:             SCOPE
1511
1512                                            ;CHARACTER LENGTH TEST
1513                                            ;TRANSMIT 1 CHARACTER ON LINE 4
1514                                            ;CHARACTER LENGTH IS 10 BITS
1515                                            ;EXPECTED RECEIVED CHARACTER IS 377
1516                                            ;LINE SPEED IS 9600 BAUD
1517
1518  004504  012767  000340  173264  T24:    MOV     #340,PS         ;DISABLE ALL INTERRUPTS
1519  004512  012767  000400  011046          MOV     #400,ICOUNT     ;SET UP FOR 400 ITERATIONS
1520  004520  012767  004632  011034          MOV     #2$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
1521  004526  012777  004000  010764          MOV     #BIT11,@DHSCR   ;MASTER CLEAR INTERFACE
1522  004534  012767  000377  011056          MOV     #377,TDATA      ;CHARACTER TO BE TRANSMITTED = 377(OCTAL)
1523  004542  012777  000004  010750          MOV     #4,@DHSCR       ;SELECT LINE 4
1524  004550  012777  177777  010752          MOV     #-1,@DHBC       ;SET UP TO TRANSMIT 1 BYTE
1525  004556  012777  015620  010742          MOV     #TDATA,@DHBA    ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1526  004564  012777  033500  010732          MOV     #33500,@DHLPR   ;SET LINE SPEED FOR 9600 BAUD
1527  004572  052777  000003  010724          BIS     #3,@DHLPR       ;SET CHARACTER LENGTH FOR 10 BITS
1528  004600  012777  000020  010724          MOV     #20,@DHBAR      ;START TRANSMITTER
1529  004606  105777  010706          1$:     TSTB    @DHSCR          ;WAIT TO RECEIVE CHARACTER
1530  004612  100375                          BPL     1$
1531  004614  017704  010702                  MOV     @DHNRC,R4       ;(R4)=RECEIVED CHARACTER
1532                                                                  ;IN LOW BYTE, AND LINE NUMBER AND
1533                                                                  ;CHARACTER STATUS IN HIGH BYTE
1534  004620  012705  102377                  MOV     #102377,R5      ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1535                                                                  ;AND LINE NUMBER AND CHARACTER
1536                                                                  ;STATUS IN HIGH BYTE
1537  004624  020504                          CMP     R5,R4           ;ARE EXPECTED AND RECEIVED DATA THE SAME
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1538  004626  001401                          BEQ     2$
1539  004630  104000                          HLT                             ;CHARACTER LENGTH, DATA
1540                                                                          ;OR LINE NUMBER ERROR
1541  004632  104400                  2$:     SCOPE
1542
1543                                          ;CHARACTER LENGTH TEST
1544                                          ;TRANSMIT 1 CHARACTER ON LINE 5
1545                                          ;CHARACTER LENGTH IS 5 BITS
1546                                          ;EXPECTED RECEIVED CHARACTER IS 37
1547                                          ;LINE SPEED IS 9600 BAUD
1548
1549  004634  012767  000340  173134  T25:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1550  004642  012767  000400  010716          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
1551  004650  012767  004762  010704          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1552  004656  012777  004000  010634          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1553  004664  012767  000037  010726          MOV     #37,TDATA               ;CHARACTER TO BE TRANSMITTED = 37(OCTAL)
1554  004672  012777  000005  010620          MOV     #5,@DHSCR               ;SELECT LINE 5
1555  004700  012777  177777  010622          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
1556  004706  012777  015620  010612          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1557  004714  012777  033500  010602          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
1558  004722  052777  000000  010574          BIS     #0,@DHLPR               ;SET CHARACTER LENGTH FOR 5 BITS
1559  004730  012777  000040  010574          MOV     #40,@DHBAR              ;START TRANSMITTER
1560  004736  105777  010556          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
1561  004742  100375                          BPL     1$
1562  004744  017704  010552                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
1563                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
1564                                                                          ;CHARACTER STATUS IN HIGH BYTE
1565  004750  012705  102437                  MOV     #102437,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1566                                                                          ;AND LINE NUMBER AND CHARACTER
1567                                                                          ;STATUS IN HIGH BYTE
1568  004754  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
1569  004756  001401                          BEQ     2$
1570  004760  104000                          HLT                             ;CHARACTER LENGTH, DATA
1571                                                                          ;OR LINE NUMBER ERROR
1572  004762  104400                  2$:     SCOPE
1573
1574                                          ;CHARACTER LENGTH TEST
1575                                          ;TRANSMIT 1 CHARACTER ON LINE 5
1576                                          ;CHARACTER LENGTH IS 6 BITS
1577                                          ;EXPECTED RECEIVED CHARACTER IS 77
1578                                          ;LINE SPEED IS 9600 BAUD
1579
1580  004764  012767  000340  173004  T26:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1581  004772  012767  000400  010566          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
1582  005000  012767  005112  010554          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1583  005006  012777  004000  010504          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1584  005014  012767  000077  010576          MOV     #77,TDATA               ;CHARACTER TO BE TRANSMITTED = 77(OCTAL)
1585  005022  012777  000005  010470          MOV     #5,@DHSCR               ;SELECT LINE 5
1586  005030  012777  177777  010472          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
1587  005036  012777  015620  010462          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1588  005044  012777  033500  010452          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
1589  005052  052777  000001  010444          BIS     #1,@DHLPR               ;SET CHARACTER LENGTH FOR 6 BITS
1590  005060  012777  000040  010444          MOV     #40,@DHBAR              ;START TRANSMITTER
1591  005066  105777  010426          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
1592  005072  100375                          BPL     1$
1593  005074  017704  010422                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
```

```
1594
1595
1596  005100  012705  102477                MOV     #102477,R5              ;IN LOW BYTE, AND LINE NUMBER AND
1597                                                                          ;CHARACTER STATUS IN HIGH BYTE
1598                                                                          ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1599  005104  020504                        CMP     R5,R4                   ;AND LINE NUMBER AND CHARACTER
1600  005106  001401                        BEQ     2$                      ;STATUS IN HIGH BYTE
1601  005110  104000                        HLT                             ;ARE EXPECTED AND RECEIVED DATA THE SAME
1602                                                                          ;CHARACTER LENGTH, DATA
1603  005112  104400              2$:       SCOPE                           ;OR LINE NUMBER ERROR
1604
1605                                        ;CHARACTER LENGTH TEST
1606                                        ;TRANSMIT 1 CHARACTER ON LINE 5
1607                                        ;CHARACTER LENGTH IS 7 BITS
1608                                        ;EXPECTED RECEIVED CHARACTER IS 177
1609                                        ;LINE SPEED IS 9600 BAUD
1610
1611  005114  012767  000340  172654  T27:  MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1612  005122  012767  000400  010436        MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
1613  005130  012767  005242  010424        MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1614  005136  012777  004000  010354        MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1615  005144  012767  000177  010446        MOV     #177,TDATA              ;CHARACTER TO BE TRANSMITTED = 177(OCTAL)
1616  005152  012777  000005  010340        MOV     #5,@DHSCR               ;SELECT LINE 5
1617  005160  012777  177777  010342        MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
1618  005166  012777  015620  010332        MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1619  005174  012777  033500  010322        MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
1620  005202  052777  000002  010314        BIS     #2,@DHLPR               ;SET CHARACTER LENGTH FOR 7 BITS
1621  005210  012777  000040  010314        MOV     #40,@DHBAR              ;START TRANSMITTER
1622  005216  105777  010276        1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
1623  005222  100375                        BPL     1$
1624  005224  017704  010272                MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
1625                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
1626                                                                          ;CHARACTER STATUS IN HIGH BYTE
1627  005230  012705  102577                MOV     #102577,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1628                                                                          ;AND LINE NUMBER AND CHARACTER
1629                                                                          ;STATUS IN HIGH BYTE
1630  005234  020504                        CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
1631  005236  001401                        BEQ     2$
1632  005240  104000                        HLT                             ;CHARACTER LENGTH, DATA
1633                                                                          ;OR LINE NUMBER ERROR
1634  005242  104400              2$:       SCOPE
1635
1636                                        ;CHARACTER LENGTH TEST
1637                                        ;TRANSMIT 1 CHARACTER ON LINE 5
1638                                        ;CHARACTER LENGTH IS 10 BITS
1639                                        ;EXPECTED RECEIVED CHARACTER IS 377
1640                                        ;LINE SPEED IS 9600 BAUD
1641
1642  005244  012767  000340  172524  T30:  MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1643  005252  012767  000400  010306        MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
1644  005260  012767  005372  010274        MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1645  005266  012777  004000  010224        MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1646  005274  012767  000377  010316        MOV     #377,TDATA              ;CHARACTER TO BE TRANSMITTED = 377(OCTAL)
1647  005302  012777  000005  010210        MOV     #5,@DHSCR               ;SELECT LINE 5
1648  005310  012777  177777  010212        MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
1649  005316  012777  015620  010202        MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
```

```
1650  005324  012777  033500  010172          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
1651  005332  052777  000003  010164          BIS     #3,@DHLPR               ;SET CHARACTER LENGTH FOR 10 BITS
1652  005340  012777  000040  010164          MOV     #40,@DHBAR              ;START TRANSMITTER
1653  005346  105777  010146          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
1654  005352  100375                          BPL     1$
1655  005354  017704  010142                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
1656                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
1657                                                                          ;CHARACTER STATUS IN HIGH BYTE
1658  005360  012705  102777                  MOV     #102777,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1659                                                                          ;AND LINE NUMBER AND CHARACTER
1660                                                                          ;STATUS IN HIGH BYTE
1661  005364  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
1662  005366  001401                          BEQ     2$
1663  005370  104000                          HLT                             ;CHARACTER LENGTH, DATA
1664                                                                          ;OR LINE NUMBER ERROR
1665  005372  104400          2$:             SCOPE
1666
1667                                          ;CHARACTER LENGTH TEST
1668                                          ;TRANSMIT 1 CHARACTER ON LINE 6
1669                                          ;CHARACTER LENGTH IS 5 BITS
1670                                          ;EXPECTED RECEIVED CHARACTER IS 37
1671                                          ;LINE SPEED IS 9600 BAUD
1672
1673  005374  012767  000340  172374  T31:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1674  005402  012767  000400  010156          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
1675  005410  012767  005522  010144          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1676  005416  012777  004000  010074          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1677  005424  012767  000037  010166          MOV     #37,TDATA               ;CHARACTER TO BE TRANSMITTED = 37(OCTAL)
1678  005432  012777  000006  010060          MOV     #6,@DHSCR               ;SELECT LINE 6
1679  005440  012777  177777  010062          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
1680  005446  012777  015620  010052          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1681  005454  012777  033500  010042          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
1682  005462  052777  000000  010034          BIS     #0,@DHLPR               ;SET CHARACTER LENGTH FOR 5 BITS
1683  005470  012777  000100  010034          MOV     #100,@DHBAR             ;START TRANSMITTER
1684  005476  105777  010016          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
1685  005502  100375                          BPL     1$
1686  005504  017704  010012                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
1687                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
1688                                                                          ;CHARACTER STATUS IN HIGH BYTE
1689  005510  012705  103037                  MOV     #103037,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1690                                                                          ;AND LINE NUMBER AND CHARACTER
1691                                                                          ;STATUS IN HIGH BYTE
1692  005514  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
1693  005516  001401                          BEQ     2$
1694  005520  104000                          HLT                             ;CHARACTER LENGTH, DATA
1695                                                                          ;OR LINE NUMBER ERROR
1696  005522  104400          2$:             SCOPE
1697
1698                                          ;CHARACTER LENGTH TEST
1699                                          ;TRANSMIT 1 CHARACTER ON LINE 6
1700                                          ;CHARACTER LENGTH IS 6 BITS
1701                                          ;EXPECTED RECEIVED CHARACTER IS 77
1702                                          ;LINE SPEED IS 9600 BAUD
1703
1704  005524  012767  000340  172244  T32:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1705  005532  012767  000400  010026          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
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1706  005540  012767  005652  010014          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1707  005546  012777  004000  007744          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1708  005554  012767  000077  010036          MOV     #77,TDATA               ;CHARACTER TO BE TRANSMITTED = 77(OCTAL)
1709  005562  012777  000006  007730          MOV     #6,@DHSCR               ;SELECT LINE 6
1710  005570  012777  177777  007732          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
1711  005576  012777  015620  007722          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1712  005604  012777  033500  007712          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
1713  005612  052777  000001  007704          BIS     #1,@DHLPR               ;SET CHARACTER LENGTH FOR 6 BITS
1714  005620  012777  000100  007704          MOV     #100,@DHBAR             ;START TRANSMITTER
1715  005626  105777  007666          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
1716  005632  100375                          BPL     1$
1717  005634  017704  007662                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
1718                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
1719                                                                          ;CHARACTER STATUS IN HIGH BYTE
1720  005640  012705  103077                  MOV     #103077,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1721                                                                          ;AND LINE NUMBER AND CHARACTER
1722                                                                          ;STATUS IN HIGH BYTE
1723  005644  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
1724  005646  001401                          BEQ     2$
1725  005650  104000                          HLT                             ;CHARACTER LENGTH, DATA
1726                                                                          ;OR LINE NUMBER ERROR
1727  005652  104400          2$:     SCOPE
1728
1729                                  ;CHARACTER LENGTH TEST
1730                                  ;TRANSMIT 1 CHARACTER ON LINE 6
1731                                  ;CHARACTER LENGTH IS 7 BITS
1732                                  ;EXPECTED RECEIVED CHARACTER IS 177
1733                                  ;LINE SPEED IS 9600 BAUD
1734
1735  005654  012767  000340  172114  T33:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1736  005662  012767  000400  007676          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
1737  005670  012767  006002  007664          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1738  005676  012777  004000  007614          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1739  005704  012767  000177  007706          MOV     #177,TDATA              ;CHARACTER TO BE TRANSMITTED = 177(OCTAL)
1740  005712  012777  000006  007600          MOV     #6,@DHSCR               ;SELECT LINE 6
1741  005720  012777  177777  007602          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
1742  005726  012777  015620  007572          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1743  005734  012777  033500  007562          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
1744  005742  052777  000002  007554          BIS     #2,@DHLPR               ;SET CHARACTER LENGTH FOR 7 BITS
1745  005750  012777  000100  007554          MOV     #100,@DHBAR             ;START TRANSMITTER
1746  005756  105777  007536          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
1747  005762  100375                          BPL     1$
1748  005764  017704  007532                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
1749                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
1750                                                                          ;CHARACTER STATUS IN HIGH BYTE
1751  005770  012705  103177                  MOV     #103177,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1752                                                                          ;AND LINE NUMBER AND CHARACTER
1753                                                                          ;STATUS IN HIGH BYTE
1754  005774  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
1755  005776  001401                          BEQ     2$
1756  006000  104000                          HLT                             ;CHARACTER LENGTH, DATA
1757                                                                          ;OR LINE NUMBER ERROR
1758  006002  104400          2$:     SCOPE
1759
1760                                  ;CHARACTER LENGTH TEST
1761                                  ;TRANSMIT 1 CHARACTER ON LINE 6
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1762                                            ;CHARACTER LENGTH IS 10 BITS
1763                                            ;EXPECTED RECEIVED CHARACTER IS 377
1764                                            ;LINE SPEED IS 9600 BAUD
1765
1766  006004  012767  000340  171764  T34:    MOV     #340,PS         ;DISABLE ALL INTERRUPTS
1767  006012  012767  000400  007546          MOV     #400,ICOUNT     ;SET UP FOR 400 ITERATIONS
1768  006020  012767  006132  007534          MOV     #2$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
1769  006026  012777  004000  007464          MOV     #BIT11,@DHSCR   ;MASTER CLEAR INTERFACE
1770  006034  012767  000377  007556          MOV     #377,TDATA      ;CHARACTER TO BE TRANSMITTED = 377(OCTAL)
1771  006042  012777  000006  007450          MOV     #6,@DHSCR       ;SELECT LINE 6
1772  006050  012777  177777  007452          MOV     #-1,@DHBC       ;SET UP TO TRANSMIT 1 BYTE
1773  006056  012777  015620  007442          MOV     #TDATA,@DHBA    ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1774  006064  012777  033500  007432          MOV     #33500,@DHLPR   ;SET LINE SPEED FOR 9600 BAUD
1775  006072  052777  000003  007424          BIS     #3,@DHLPR       ;SET CHARACTER LENGTH FOR 10 BITS
1776  006100  012777  000100  007424          MOV     #100,@DHBAR     ;START TRANSMITTER
1777  006106  105777  007406          1$:     TSTB    @DHSCR          ;WAIT TO RECEIVE CHARACTER
1778  006112  100375                          BPL     1$
1779  006114  017704  007402                  MOV     @DHNRC,R4       ;(R4)=RECEIVED CHARACTER
1780                                                                  ;IN LOW BYTE, AND LINE NUMBER AND
1781                                                                  ;CHARACTER STATUS IN HIGH BYTE
1782  006120  012705  103377                  MOV     #103377,R5      ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1783                                                                  ;AND LINE NUMBER AND CHARACTER
1784                                                                  ;STATUS IN HIGH BYTE
1785  006124  020504                          CMP     R5,R4           ;ARE EXPECTED AND RECEI''ED DATA THE SAME
1786  006126  001401                          BEQ     2$
1787  006130  104000                          HLT                     ;CHARACTER LENGTH, DATA
1788                                                                  ;OR LINE NUMBER ERROR
1789  006132  104400          2$:     SCOPE
1790
1791                                            ;CHARACTER LENGTH TEST
1792                                            ;TRANSMIT 1 CHARACTER ON LINE 7
1793                                            ;CHARACTER LENGTH IS 5 BITS
1794                                            ;EXPECTED RECEIVED CHARACTER IS 37
1795                                            ;LINE SPEED IS 9600 BAUD
1796
1797  006134  012767  000340  171634  T35:    MOV     #340,PS         ;DISABLE ALL INTERRUPTS
1798  006142  012767  000400  007416          MOV     #400,ICOUNT     ;SET UP FOR 400 ITERATIONS
1799  006150  012767  006262  007404          MOV     #2$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
1800  006156  012777  004000  007334          MOV     #BIT11,@DHSCR   ;MASTER CLEAR INTERFACE
1801  006164  012767  000037  007426          MOV     #37,TDATA       ;CHARACTER TO BE TRANSMITTED = 37(OCTAL)
1802  006172  012777  000007  007320          MOV     #7,@DHSCR       ;SELECT LINE 7
1803  006200  012777  177777  007322          MOV     #-1,@DHBC       ;SET UP TO TRANSMIT 1 BYTE
1804  006206  012777  015620  007312          MOV     #TDATA,@DHBA    ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1805  006214  012777  033500  007302          MOV     #33500,@DHLPR   ;SET LINE SPEED FOR 9600 BAUD
1806  006222  052777  000000  007274          BIS     #0,@DHLPR       ;SET CHARACTER LENGTH FOR 5 BITS
1807  006230  012777  000200  007274          MOV     #200,@DHBAR     ;START TRANSMITTER
1808  006236  105777  007256          1$:     TSTB    @DHSCR          ;WAIT TO RECEIVE CHARACTER
1809  006242  100375                          BPL     1$
1810  006244  017704  007252                  MOV     @DHNRC,R4       ;(R4)=RECEIVED CHARACTER
1811                                                                  ;IN LOW BYTE, AND LINE NUMBER AND
1812                                                                  ;CHARACTER STATUS IN HIGH BYTE
1813  006250  012705  103437                  MOV     #103437,R5      ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1814                                                                  ;AND LINE NUMBER AND CHARACTER
1815                                                                  ;STATUS IN HIGH BYTE
1816  006254  020504                          CMP     R5,R4           ;ARE EXPECTED AND RECEIVED DATA THE SAME
1817  006256  001401                          BEQ     2$
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1818  006260  104000                          HLT                             ;CHARACTER LENGTH, DATA
1819                                                                          ;OR LINE NUMBER ERROR
1820  006262  104400                  2$:     SCOPE
1821
1822                                          ;CHARACTER LENGTH TEST
1823                                          ;TRANSMIT 1 CHARACTER ON LINE 7
1824                                          ;CHARACTER LENGTH IS 6 BITS
1825                                          ;EXPECTED RECEIVED CHARACTER IS 77
1826                                          ;LINE SPEED IS 9600 BAUD
1827
1828  006264  012767  000340  171504  T36:   MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1829  006272  012767  000400  007266        MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
1830  006300  012767  006412  007254        MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1831  006306  012777  004000  007204        MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1832  006314  012767  000077  007276        MOV     #77,TDATA               ;CHARACTER TO BE TRANSMITTED = 77(OCTAL)
1833  006322  012777  000007  007170        MOV     #7,@DHSCR               ;SELECT LINE 7
1834  006330  012777  177777  007172        MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
1835  006336  012777  015620  007162        MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1836  006344  012777  033500  007152        MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
1837  006352  052777  000001  007144        BIS     #1,@DHLPR               ;SET CHARACTER LENGTH FOR 6 BITS
1838  006360  012777  000200  007144        MOV     #200,@DHBAR             ;START TRANSMITTER
1839  006366  105777  007126          1$:   TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
1840  006372  100375                        BPL     1$
1841  006374  017704  007122                MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
1842                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
1843                                                                          ;CHARACTER STATUS IN HIGH BYTE
1844  006400  012705  103477                MOV     #103477,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1845                                                                          ;AND LINE NUMBER AND CHARACTER
1846                                                                          ;STATUS IN HIGH BYTE
1847  006404  020504                        CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
1848  006406  001401                        BEQ     2$
1849  006410  104000                        HLT                             ;CHARACTER LENGTH, DATA
1850                                                                          ;OR LINE NUMBER ERROR
1851  006412  104400                  2$:     SCOPE
1852
1853                                          ;CHARACTER LENGTH TEST
1854                                          ;TRANSMIT 1 CHARACTER ON LINE 7
1855                                          ;CHARACTER LENGTH IS 7 BITS
1856                                          ;EXPECTED RECEIVED CHARACTER IS 177
1857                                          ;LINE SPEED IS 9600 BAUD
1858
1859  006414  012767  000340  171354  T37:   MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1860  006422  012767  000400  007136        MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
1861  006430  012767  006542  007124        MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1862  006436  012777  004000  007054        MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1863  006444  012767  000177  007146        MOV     #177,TDATA              ;CHARACTER TO BE TRANSMITTED = 177(OCTAL)
1864  006452  012777  000007  007040        MOV     #7,@DHSCR               ;SELECT LINE 7
1865  006460  012777  177777  007042        MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
1866  006466  012777  015620  007032        MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1867  006474  012777  033500  007022        MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
1868  006502  052777  000002  007014        BIS     #2,@DHLPR               ;SET CHARACTER LENGTH FOR 7 BITS
1869  006510  012777  000200  007014        MOV     #200,@DHBAR             ;START TRANSMITTER
1870  006516  105777  006776          1$:   TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
1871  006522  100375                        BPL     1$
1872  006524  017704  006772                MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
1873                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
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1874
1875  006530  012705  103577                  MOV     #103577,R5              ;CHARACTER STATUS IN HIGH BYTE
1876                                                                            ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1877                                                                            ;AND LINE NUMBER AND CHARACTER
1878  006534  020504                          CMP     R5,R4                   ;STATUS IN HIGH BYTE
1879  006536  001401                          BEQ     2$                      ;ARE EXPECTED AND RECEIVED DATA THE SAME
1880  006540  104000                          HLT                             ;CHARACTER LENGTH, DATA
1881                                                                            ;OR LINE NUMBER ERROR
1882  006542  104400              2$:         SCOPE
1883
1884                                          ;CHARACTER LENGTH TEST
1885                                          ;TRANSMIT 1 CHARACTER ON LINE 7
1886                                          ;CHARACTER LENGTH IS 10 BITS
1887                                          ;EXPECTED RECEIVED CHARACTER IS 377
1888                                          ;LINE SPEED IS 9600 BAUD
1889
1890  006544  012767  000340  171224  T40:   MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1891  006552  012767  000400  007006        MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
1892  006560  012767  006672  006774        MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1893  006566  012777  004000  006724        MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1894  006574  012767  000377  007016        MOV     #377,TDATA              ;CHARACTER TO BE TRANSMITTED = 377(OCTAL)
1895  006602  012777  000007  006710        MOV     #7,@DHSCR               ;SELECT LINE 7
1896  006610  012777  177777  006712        MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
1897  006616  012777  015620  006702        MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1898  006624  012777  033500  006672        MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
1899  006632  052777  000003  006664        BIS     #3,@DHLPR               ;SET CHARACTER LENGTH FOR 10 BITS
1900  006640  012777  000200  006664        MOV     #200,@DHBAR             ;START TRANSMITTER
1901  006646  105777  006646              1$:   TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
1902  006652  100375                        BPL     1$
1903  006654  017704  006642                MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
1904                                                                            ;IN LOW BYTE, AND LINE NUMBER AND
1905                                                                            ;CHARACTER STATUS IN HIGH BYTE
1906  006660  012705  103777                MOV     #103777,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
1907                                                                            ;AND LINE NUMBER AND CHARACTER
1908                                                                            ;STATUS IN HIGH BYTE
1909  006664  020504                        CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
1910  006666  001401                        BEQ     2$
1911  006670  104000                        HLT                             ;CHARACTER LENGTH, DATA
1912                                                                            ;OR LINE NUMBER ERROR
1913  006672  104400              2$:       SCOPE
1914
1915                                        ;CHARACTER LENGTH TEST
1916                                        ;TRANSMIT 1 CHARACTER ON LINE 10
1917                                        ;CHARACTER LENGTH IS 5 BITS
1918                                        ;EXPECTED RECEIVED CHARACTER IS 37
1919                                        ;LINE SPEED IS 9600 BAUD
1920
1921  006674  012767  000340  171074  T41:   MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
1922  006702  012767  000400  006656        MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
1923  006710  012767  007022  006644        MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
1924  006716  012777  004000  006574        MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
1925  006724  012767  000037  006666        MOV     #37,TDATA               ;CHARACTER TO BE TRANSMITTED = 37(OCTAL)
1926  006732  012777  000010  006560        MOV     #10,@DHSCR              ;SELECT LINE 10
1927  006740  012777  177777  006562        MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
1928  006746  012777  015620  006552        MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
1929  006754  012777  033500  006542        MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
```

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 1930  006762  052777  000000  006534          BIS     #0,@DHLPR               ;SET CHARACTER LENGTH FOR 5 BITS
 1931  006770  012777  000400  006534          MOV     #400,@DHBAR             ;START TRANSMITTER
 1932  006776  105777  006516          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
 1933  007002  100375                          BPL     1$
 1934  007004  017704  006512                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
 1935                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
 1936                                                                          ;CHARACTER STATUS IN HIGH BYTE
 1937  007010  012705  104037                  MOV     #104037,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
 1938                                                                          ;AND LINE NUMBER AND CHARACTER
 1939                                                                          ;STATUS IN HIGH BYTE
 1940  007014  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
 1941  007016  001401                          BEQ     2$
 1942  007020  104000                          HLT                             ;CHARACTER LENGTH, DATA
 1943                                                                          ;OR LINE NUMBER ERROR
 1944  007022  104400          2$:             SCOPE
 1945
 1946                                          ;CHARACTER LENGTH TEST
 1947                                          ;TRANSMIT 1 CHARACTER ON LINE 10
 1948                                          ;CHARACTER LENGTH IS 6 BITS
 1949                                          ;EXPECTED RECEIVED CHARACTER IS 77
 1950                                          ;LINE SPEED IS 9600 BAUD
 1951
 1952  007024  012767  000340  170744  T42:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
 1953  007032  012767  000400  006526          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
 1954  007040  012767  007152  006514          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
 1955  007046  012777  004000  006444          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
 1956  007054  012767  000077  006536          MOV     #77,TDATA               ;CHARACTER TO BE TRANSMITTED = 77(OCTAL)
 1957  007062  012777  000010  006430          MOV     #10,@DHSCR              ;SELECT LINE 10
 1958  007070  012777  177777  006432          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
 1959  007076  012777  015620  006422          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
 1960  007104  012777  033500  006412          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
 1961  007112  052777  000001  006404          BIS     #1,@DHLPR               ;SET CHARACTER LENGTH FOR 6 BITS
 1962  007120  012777  000400  006404          MOV     #400,@DHBAR             ;START TRANSMITTER
 1963  007126  105777  006366          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
 1964  007132  100375                          BPL     1$
 1965  007134  017704  006362                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
 1966                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
 1967                                                                          ;CHARACTER STATUS IN HIGH BYTE
 1968  007140  012705  104077                  MOV     #104077,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
 1969                                                                          ;AND LINE NUMBER AND CHARACTER
 1970                                                                          ;STATUS IN HIGH BYTE
 1971  007144  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
 1972  007146  001401                          BEQ     2$
 1973  007150  104000                          HLT                             ;CHARACTER LENGTH, DATA
 1974                                                                          ;OR LINE NUMBER ERROR
 1975  007152  104400          2$:             SCOPE
 1976
 1977                                          ;CHARACTER LENGTH TEST
 1978                                          ;TRANSMIT 1 CHARACTER ON LINE 10
 1979                                          ;CHARACTER LENGTH IS 7 BITS
 1980                                          ;EXPECTED RECEIVED CHARACTER IS 177
 1981                                          ;LINE SPEED IS 9600 BAUD
 1982
 1983  007154  012767  000340  170614  T43:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
 1984  007162  012767  000400  006376          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
 1985  007170  012767  007302  006364          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
```

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 1986  007176  012777  004000  006314          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
 1987  007204  012767  000177  006406          MOV     #177,TDATA              ;CHARACTER TO BE TRANSMITTED = 177(OCTAL)
 1988  007212  012777  000010  006300          MOV     #10.,@DHSCR             ;SELECT LINE 10
 1989  007220  012777  177777  006302          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
 1990  007226  012777  015620  006272          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
 1991  007234  012777  033500  006262          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
 1992  007242  052777  000002  006254          BIS     #2,@DHLPR               ;SET CHARACTER LENGTH FOR 7 BITS
 1993  007250  012777  000400  006254          MOV     #400,@DHBAR             ;START TRANSMITTER
 1994  007256  105777  006236          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
 1995  007262  100375                          BPL     1$
 1996  007264  017704  006232                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
 1997                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
 1998                                                                          ;CHARACTER STATUS IN HIGH BYTE
 1999  007270  012705  104177                  MOV     #104177,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
 2000                                                                          ;AND LINE NUMBER AND CHARACTER
 2001                                                                          ;STATUS IN HIGH BYTE
 2002  007274  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
 2003  007276  001401                          BEQ     2$
 2004  007300  104000                          HLT                             ;CHARACTER LENGTH, DATA
 2005                                                                          ;OR LINE NUMBER ERROR
 2006  007302  104400          2$:             SCOPE
 2007
 2008                                          ;CHARACTER LENGTH TEST
 2009                                          ;TRANSMIT 1 CHARACTER ON LINE 10
 2010                                          ;CHARACTER LENGTH IS 10 BITS
 2011                                          ;EXPECTED RECEIVED CHARACTER IS 377
 2012                                          ;LINE SPEED IS 9600 BAUD
 2013
 2014  007304  012767  000340  170464  T44:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
 2015  007312  012767  000400  006246          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
 2016  007320  012767  007432  006234          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
 2017  007326  012777  004000  006164          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
 2018  007334  012767  000377  006256          MOV     #377,TDATA              ;CHARACTER TO BE TRANSMITTED = 377(OCTAL)
 2019  007342  012777  000010  006150          MOV     #10.,@DHSCR             ;SELECT LINE 10
 2020  007350  012777  177777  006152          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
 2021  007356  012777  015620  006142          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
 2022  007364  012777  033500  006132          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
 2023  007372  052777  000003  006124          BIS     #3,@DHLPR               ;SET CHARACTER LENGTH FOR 10 BITS
 2024  007400  012777  000400  006124          MOV     #400,@DHBAR             ;START TRANSMITTER
 2025  007406  105777  006106          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
 2026  007412  100375                          BPL     1$
 2027  007414  017704  006102                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
 2028                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
 2029                                                                          ;CHARACTER STATUS IN HIGH BYTE
 2030  007420  012705  104377                  MOV     #104377,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
 2031                                                                          ;AND LINE NUMBER AND CHARACTER
 2032                                                                          ;STATUS IN HIGH BYTE
 2033  007424  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
 2034  007426  001401                          BEQ     2$
 2035  007430  104000                          HLT                             ;CHARACTER LENGTH, DATA
 2036                                                                          ;OR LINE NUMBER ERROR
 2037  007432  104400          2$:             SCOPE
 2038
 2039                                          ;CHARACTER LENGTH TEST
 2040                                          ;TRANSMIT 1 CHARACTER ON LINE 11
 2041                                          ;CHARACTER LENGTH IS 5 BITS
```

```
2042                                            ;EXPECTED RECEIVED CHARACTER IS 37
2043                                            ;LINE SPEED IS 9600 BAUD
2044
2045  007434  012767  000340  170334  T45:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2046  007442  012767  000400  006116          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
2047  007450  012767  007562  006104          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2048  007456  012777  004000  006034          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2049  007464  012767  000037  006126          MOV     #37,TDATA               ;CHARACTER TO BE TRANSMITTED = 37(OCTAL)
2050  007472  012777  000011  006020          MOV     #11,@DHSCR              ;SELECT LINE 11
2051  007500  012777  177777  006022          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
2052  007506  012777  015620  006012          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
2053  007514  012777  033500  006002          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
2054  007522  052777  000000  005774          BIS     #0,@DHLPR               ;SET CHARACTER LENGTH FOR 5 BITS
2055  007530  012777  001000  005774          MOV     #1000,@DHBAR            ;START TRANSMITTER
2056  007536  105777  005756          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
2057  007542  100375                          BPL     1$
2058  007544  017704  005752                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
2059                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
2060                                                                          ;CHARACTER STATUS IN HIGH BYTE
2061  007550  012705  104437                  MOV     #104437,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
2062                                                                          ;AND LINE NUMBER AND CHARACTER
2063                                                                          ;STATUS IN HIGH BYTE
2064  007554  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
2065  007556  001401                          BEQ     2$
2066  007560  104000                          HLT                             ;CHARACTER LENGTH, DATA
2067                                                                          ;OR LINE NUMBER ERROR
2068  007562  104400          2$:             SCOPE
2069
2070                                            ;CHARACTER LENGTH TEST
2071                                            ;TRANSMIT 1 CHARACTER ON LINE 11
2072                                            ;CHARACTER LENGTH IS 6 BITS
2073                                            ;EXPECTED RECEIVED CHARACTER IS 77
2074                                            ;LINE SPEED IS 9600 BAUD
2075
2076  007564  012767  000340  170204  T46:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2077  007572  012767  000400  005766          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
2078  007600  012767  007712  005754          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2079  007606  012777  004000  005704          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2080  007614  012767  000077  005776          MOV     #77,TDATA               ;CHARACTER TO BE TRANSMITTED = 77(OCTAL)
2081  007622  012777  000011  005670          MOV     #11,@DHSCR              ;SELECT LINE 11
2082  007630  012777  177777  005672          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
2083  007636  012777  015620  005662          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
2084  007644  012777  033500  005652          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
2085  007652  052777  000001  005644          BIS     #1,@DHLPR               ;SET CHARACTER LENGTH FOR 6 BITS
2086  007660  012777  001000  005644          MOV     #1000,@DHBAR            ;START TRANSMITTER
2087  007666  105777  005626          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
2088  007672  100375                          BPL     1$
2089  007674  017704  005622                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
2090                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
2091                                                                          ;CHARACTER STATUS IN HIGH BYTE
2092  007700  012705  104477                  MOV     #104477,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
2093                                                                          ;AND LINE NUMBER AND CHARACTER
2094                                                                          ;STATUS IN HIGH BYTE
2095  007704  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
2096  007706  001401                          BEQ     2$
2097  007710  104000                          HLT                             ;CHARACTER LENGTH, DATA
```

```
                                                                        ;OR LINE NUMBER ERROR
007712  104400                  2$:     SCOPE

                                        ;CHARACTER LENGTH TEST
                                        ;TRANSMIT 1 CHARACTER ON LINE 11
                                        ;CHARACTER LENGTH IS 7 BITS
                                        ;EXPECTED RECEIVED CHARACTER IS 177
                                        ;LINE SPEED IS 9600 BAUD

007714  012767  000340  170054  T47:    MOV     #340,PS         ;DISABLE ALL INTERRUPTS
007722  012767  000400  005636          MOV     #400,ICOUNT     ;SET UP FOR 400 ITERATIONS
007730  012767  010042  005624          MOV     #2$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
007736  012777  004000  005554          MOV     #BIT11,@DHSCR   ;MASTER CLEAR INTERFACE
007744  012767  000177  005646          MOV     #177,TDATA      ;CHARACTER TO BE TRANSMITTED = 177(OCTAL)
007752  012777  000011  005540          MOV     #11,@DHSCR      ;SELECT LINE 11
007760  012777  177777  005542          MOV     #-1,@DHBC       ;SET UP TO TRANSMIT 1 BYTE
007766  012777  015620  005532          MOV     #TDATA,@DHBA    ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
007774  012777  033500  005522          MOV     #33500,@DHLPR   ;SET LINE SPEED FOR 9600 BAUD
010002  052777  000002  005514          BIS     #2,@DHLPR       ;SET CHARACTER LENGTH FOR 7 BITS
010010  012777  001000  005514          MOV     #1000,@DHBAR    ;START TRANSMITTER
010016  105777  005476          1$:     TSTB    @DHSCR          ;WAIT TO RECEIVE CHARACTER
010022  100375                          BPL     1$
010024  017704  005472                  MOV     @DHNRC,R4       ;(R4)=RECEIVED CHARACTER
                                                                ;IN LOW BYTE, AND LINE NUMBER AND
                                                                ;CHARACTER STATUS IN HIGH BYTE
010030  012705  104577                  MOV     #104577,R5      ;(R5)=EXPECTED CHARACTER IN LOW BYTE
                                                                ;AND LINE NUMBER AND CHARACTER
                                                                ;STATUS IN HIGH BYTE
010034  020504                          CMP     R5,R4           ;ARE EXPECTED AND RECEIVED DATA THE SAME
010036  001401                          BEQ     2$
010040  104000                          HLT                     ;CHARACTER LENGTH, DATA
                                                                ;OR LINE NUMBER ERROR
010042  104400                  2$:     SCOPE

                                        ;CHARACTER LENGTH TEST
                                        ;TRANSMIT 1 CHARACTER ON LINE 11
                                        ;CHARACTER LENGTH IS 10 BITS
                                        ;EXPECTED RECEIVED CHARACTER IS 377
                                        ;LINE SPEED IS 9600 BAUD

010044  012767  000340  167724  T50:    MOV     #340,PS         ;DISABLE ALL INTERRUPTS
010052  012767  000400  005506          MOV     #400,ICOUNT     ;SET UP FOR 400 ITERATIONS
010060  012767  010172  005474          MOV     #2$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
010066  012777  004000  005424          MOV     #BIT11,@DHSCR   ;MASTER CLEAR INTERFACE
010074  012767  000377  005516          MOV     #377,TDATA      ;CHARACTER TO BE TRANSMITTED = 377(OCTAL)
010102  012777  000011  005410          MOV     #11,@DHSCR      ;SELECT LINE 11
010110  012777  177777  005412          MOV     #-1,@DHBC       ;SET UP TO TRANSMIT 1 BYTE
010116  012777  015620  005402          MOV     #TDATA,@DHBA    ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
010124  012777  033500  005372          MOV     #33500,@DHLPR   ;SET LINE SPEED FOR 9600 BAUD
010132  052777  000003  005364          BIS     #3,@DHLPR       ;SET CHARACTER LENGTH FOR 10 BITS
010140  012777  001000  005364          MOV     #1000,@DHBAR    ;START TRANSMITTER
010146  105777  005346          1$:     TSTB    @DHSCR          ;WAIT TO RECEIVE CHARACTER
010152  100375                          BPL     1$
010154  017704  005342                  MOV     @DHNRC,R4       ;(R4)=RECEIVED CHARACTER
                                                                ;IN LOW BYTE, AND LINE NUMBER AND
                                                                ;CHARACTER STATUS IN HIGH BYTE
```

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2154  010160  012705  104777                MOV     #104777,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
2155                                                                          ;AND LINE NUMBER AND CHARACTER
2156                                                                          ;STATUS IN HIGH BYTE
2157  010164  020504                        CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
2158  010166  001401                        BEQ     2$
2159  010170  104000                        HLT                             ;CHARACTER LENGTH, DATA
2160                                                                          ;OR LINE NUMBER ERROR
2161  010172  104400              2$:       SCOPE
2162
2163                                        ;CHARACTER LENGTH TEST
2164                                        ;TRANSMIT 1 CHARACTER ON LINE 12
2165                                        ;CHARACTER LENGTH IS 5 BITS
2166                                        ;EXPECTED RECEIVED CHARACTER IS 37
2167                                        ;LINE SPEED IS 9600 BAUD
2168
2169  010174  012767  000340  167574  T51:  MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2170  010202  012767  000400  005356        MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
2171  010210  012767  010322  005344        MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2172  010216  012777  004000  005274        MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2173  010224  012767  000037  005366        MOV     #37,TDATA               ;CHARACTER TO BE TRANSMITTED = 37(OCTAL)
2174  010232  012777  000012  005260        MOV     #12,@DHSCR              ;SELECT LINE 12
2175  010240  012777  177777  005262        MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
2176  010246  012777  015620  005252        MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
2177  010254  012777  033500  005242        MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
2178  010262  052777  000000  005234        BIS     #0,@DHLPR               ;SET CHARACTER LENGTH FOR 5 BITS
2179  010270  012777  002000  005234        MOV     #2000,@DHBAR            ;START TRANSMITTER
2180  010276  105777  005216        1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
2181  010302  100375                        BPL     1$
2182  010304  017704  005212                MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
2183                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
2184                                                                          ;CHARACTER STATUS IN HIGH BYTE
2185  010310  012705  105037                MOV     #105037,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
2186                                                                          ;AND LINE NUMBER AND CHARACTER
2187                                                                          ;STATUS IN HIGH BYTE
2188  010314  020504                        CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
2189  010316  001401                        BEQ     2$
2190  010320  104000                        HLT                             ;CHARACTER LENGTH, DATA
2191                                                                          ;OR LINE NUMBER ERROR
2192  010322  104400              2$:       SCOPE
2193
2194                                        ;CHARACTER LENGTH TEST
2195                                        ;TRANSMIT 1 CHARACTER ON LINE 12
2196                                        ;CHARACTER LENGTH IS 6 BITS
2197                                        ;EXPECTED RECEIVED CHARACTER IS 77
2198                                        ;LINE SPEED IS 9600 BAUD
2199
2200  010324  012767  000340  167444  T52:  MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2201  010332  012767  000400  005226        MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
2202  010340  012767  010452  005214        MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2203  010346  012777  004000  005144        MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2204  010354  012767  000077  005236        MOV     #77,TDATA               ;CHARACTER TO BE TRANSMITTED = 77(OCTAL)
2205  010362  012777  000012  005130        MOV     #12,@DHSCR              ;SELECT LINE 12
2206  010370  012777  177777  005132        MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
2207  010376  012777  015620  005122        MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
2208  010404  012777  033500  005112        MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
2209  010412  052777  000001  005104        BIS     #1,@DHLPR               ;SET CHARACTER LENGTH FOR 6 BITS
```

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2210  010420  012777  002000  005104          MOV     #2000,@DHBAR            ;START TRANSMITTER
2211  010426  105777  005066          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
2212  010432  100375                          BPL     1$
2213  010434  017704  005062                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
2214                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
2215                                                                          ;CHARACTER STATUS IN HIGH BYTE
2216  010440  012705  105077                  MOV     #105077,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
2217                                                                          ;AND LINE NUMBER AND CHARACTER
2218                                                                          ;STATUS IN HIGH BYTE
2219  010444  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
2220  010446  001401                          BEQ     2$
2221  010450  104000                          HLT                             ;CHARACTER LENGTH, DATA
2222                                                                          ;OR LINE NUMBER ERROR
2223  010452  104400                2$:      SCOPE
2224
2225                                          ;CHARACTER LENGTH TEST
2226                                          ;TRANSMIT 1 CHARACTER ON LINE 12
2227                                          ;CHARACTER LENGTH IS 7 BITS
2228                                          ;EXPECTED RECEIVED CHARACTER IS 177
2229                                          ;LINE SPEED IS 9600 BAUD
2230
2231  010454  012767  000340  167314  T53:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2232  010462  012767  000400  005076          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
2233  010470  012767  010602  005064          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2234  010476  012777  004000  005014          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2235  010504  012767  000177  005106          MOV     #177,TDATA              ;CHARACTER TO BE TRANSMITTED = 177(OCTAL)
2236  010512  012777  000012  005000          MOV     #12,@DHSCR              ;SELECT LINE 12
2237  010520  012777  177777  005002          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
2238  010526  012777  015620  004772          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
2239  010534  012777  033500  004762          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
2240  010542  052777  000002  004754          BIS     #2,@DHLPR               ;SET CHARACTER LENGTH FOR 7 BITS
2241  010550  012777  002000  004754          MOV     #2000,@DHBAR            ;START TRANSMITTER
2242  010556  105777  004736          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
2243  010562  100375                          BPL     1$
2244  010564  017704  004732                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
2245                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
2246                                                                          ;CHARACTER STATUS IN HIGH BYTE
2247  010570  012705  105177                  MOV     #105177,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
2248                                                                          ;AND LINE NUMBER AND CHARACTER
2249                                                                          ;STATUS IN HIGH BYTE
2250  010574  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
2251  010576  001401                          BEQ     2$
2252  010600  104000                          HLT                             ;CHARACTER LENGTH, DATA
2253                                                                          ;OR LINE NUMBER ERROR
2254  010602  104400                2$:      SCOPE
2255
2256                                          ;CHARACTER LENGTH TEST
2257                                          ;TRANSMIT 1 CHARACTER ON LINE 12
2258                                          ;CHARACTER LENGTH IS 10 BITS
2259                                          ;EXPECTED RECEIVED CHARACTER IS 377
2260                                          ;LINE SPEED IS 9600 BAUD
2261
2262  010604  012767  000340  167164  T54:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2263  010612  012767  000400  004746          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
2264  010620  012767  010732  004734          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2265  010626  012777  004000  004664          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
```

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2266  010634  012767  000377  004756          MOV     #377,TDATA              ;CHARACTER TO BE TRANSMITTED = 377(OCTAL)
2267  010642  012777  000012  004650          MOV     #12,@DHSCR              ;SELECT LINE 12
2268  010650  012777  177777  004652          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
2269  010656  012777  015620  004642          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
2270  010664  012777  033500  004632          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
2271  010672  052777  000003  004624          BIS     #3,@DHLPR               ;SET CHARACTER LENGTH FOR 10 BITS
2272  010700  012777  002000  004624          MOV     #2000,@DHBAR            ;START TRANSMITTER
2273  010706  105777  004606          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
2274  010712  100375                          BPL     1$
2275  010714  017704  004602                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
2276                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
2277                                                                          ;CHARACTER STATUS IN HIGH BYTE
2278  010720  012705  105377                  MOV     #105377,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
2279                                                                          ;AND LINE NUMBER AND CHARACTER
2280                                                                          ;STATUS IN HIGH BYTE
2281  010724  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
2282  010726  001401                          BEQ     2$
2283  010730  104000                          HLT                             ;CHARACTER LENGTH, DATA
2284                                                                          ;OR LINE NUMBER ERROR
2285  010732  104400          2$:     SCOPE
2286
2287                                  ;CHARACTER LENGTH TEST
2288                                  ;TRANSMIT 1 CHARACTER ON LINE 13
2289                                  ;CHARACTER LENGTH IS 5 BITS
2290                                  ;EXPECTED RECEIVED CHARACTER IS 37
2291                                  ;LINE SPEED IS 9600 BAUD
2292
2293  010734  012767  000340  167034  T55:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2294  010742  012767  000400  004616          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
2295  010750  012767  011062  004604          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2296  010756  012777  004000  004534          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2297  010764  012767  000037  004626          MOV     #37,TDATA               ;CHARACTER TO BE TRANSMITTED = 37(OCTAL)
2298  010772  012777  000013  004520          MOV     #13,@DHSCR              ;SELECT LINE 13
2299  011000  012777  177777  004522          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
2300  011006  012777  015620  004512          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
2301  011014  012777  033500  004502          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
2302  011022  052777  000000  004474          BIS     #0,@DHLPR               ;SET CHARACTER LENGTH FOR 5 BITS
2303  011030  012777  004000  004474          MOV     #4000,@DHBAR            ;START TRANSMITTER
2304  011036  105777  004456          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
2305  011042  100375                          BPL     1$
2306  011044  017704  004452                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
2307                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
2308                                                                          ;CHARACTER STATUS IN HIGH BYTE
2309  011050  012705  105437                  MOV     #105437,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
2310                                                                          ;AND LINE NUMBER AND CHARACTER
2311                                                                          ;STATUS IN HIGH BYTE
2312  011054  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
2313  011056  001401                          BEQ     2$
2314  011060  104000                          HLT                             ;CHARACTER LENGTH, DATA
2315                                                                          ;OR LINE NUMBER ERROR
2316  011062  104400          2$:     SCOPE
2317
2318                                  ;CHARACTER LENGTH TEST
2319                                  ;TRANSMIT 1 CHARACTER ON LINE 13
2320                                  ;CHARACTER LENGTH IS 6 BITS
2321                                  ;EXPECTED RECEIVED CHARACTER IS 77
```

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                                        ;LINE SPEED IS 9600 BAUD

011064  012767  000340  166704  T56:  MOV   #340,PS          ;DISABLE ALL INTERRUPTS
011072  012767  000400  004466        MOV   #400,ICOUNT      ;SET UP FOR 400 ITERATIONS
011100  012767  011212  004454        MOV   #2$,ESCAPE       ;SET UP TO ESCAPE TO NEXT TEST
011106  012777  004000  004404        MOV   #BIT11,@DHSCR    ;MASTER CLEAR INTERFACE
011114  012767  000077  004476        MOV   #77,TDATA        ;CHARACTER TO BE TRANSMITTED = 77(OCTAL)
011122  012777  000013  004370        MOV   #13,@DHSCR       ;SELECT LINE 13
011130  012777  177777  004372        MOV   #-1,@DHBC        ;SET UP TO TRANSMIT 1 BYTE
011136  012777  015620  004362        MOV   #TDATA,@DHBA     ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
011144  012777  033500  004352        MOV   #33500,@DHLPR    ;SET LINE SPEED FOR 9600 BAUD
011152  052777  000001  004344        BIS   #1,@DHLPR        ;SET CHARACTER LENGTH FOR 6 BITS
011160  012777  004000  004344        MOV   #4000,@DHBAR     ;START TRANSMITTER
011166  105777  004326        1$:     TSTB  @DHSCR           ;WAIT TO RECEIVE CHARACTER
011172  100375                       BPL   1$
011174  017704  004322              MOV   @DHNRC,R4          ;(R4)=RECEIVED CHARACTER
                                                             ;IN LOW BYTE, AND LINE NUMBER AND
                                                             ;CHARACTER STATUS IN HIGH BYTE
011200  012705  105477              MOV   #105477,R5         ;(R5)=EXPECTED CHARACTER IN LOW BYTE
                                                             ;AND LINE NUMBER AND CHARACTER
                                                             ;STATUS IN HIGH BYTE
011204  020504                       CMP   R5,R4             ;ARE EXPECTED AND RECEIVED DATA THE SAME
011206  001401                       BEQ   2$
011210  104000                       HLT                     ;CHARACTER LENGTH, DATA
                                                             ;OR LINE NUMBER ERROR
011212  104400              2$:     SCOPE

                                        ;CHARACTER LENGTH TEST
                                        ;TRANSMIT 1 CHARACTER ON LINE 13
                                        ;CHARACTER LENGTH IS 7 BITS
                                        ;EXPECTED RECEIVED CHARACTER IS 177
                                        ;LINE SPEED IS 9600 BAUD

011214  012767  000340  166554  T57:  MOV   #340,PS          ;DISABLE ALL INTERRUPTS
011222  012767  000400  004336        MOV   #400,ICOUNT      ;SET UP FOR 400 ITERATIONS
011230  012767  011342  004324        MOV   #2$,ESCAPE       ;SET UP TO ESCAPE TO NEXT TEST
011236  012777  004000  004254        MOV   #BIT11,@DHSCR    ;MASTER CLEAR INTERFACE
011244  012767  000177  004346        MOV   #177,TDATA       ;CHARACTER TO BE TRANSMITTED = 177(OCTAL)
011252  012777  000013  004240        MOV   #13,@DHSCR       ;SELECT LINE 13
011260  012777  177777  004242        MOV   #-1,@DHBC        ;SET UP TO TRANSMIT 1 BYTE
011266  012777  015620  004232        MOV   #TDATA,@DHBA     ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
011274  012777  033500  004222        MOV   #33500,@DHLPR    ;SET LINE SPEED FOR 9600 BAUD
011302  052777  000002  004214        BIS   #2,@DHLPR        ;SET CHARACTER LENGTH FOR 7 BITS
011310  012777  004000  004214        MOV   #4000,@DHBAR     ;START TRANSMITTER
011316  105777  004176        1$:     TSTB  @DHSCR           ;WAIT TO RECEIVE CHARACTER
011322  100375                       BPL   1$
011324  017704  004172              MOV   @DHNRC,R4          ;(R4)=RECEIVED CHARACTER
                                                             ;IN LOW BYTE, AND LINE NUMBER AND
                                                             ;CHARACTER STATUS IN HIGH BYTE
011330  012705  105577              MOV   #105577,R5         ;(R5)=EXPECTED CHARACTER IN LOW BYTE
                                                             ;AND LINE NUMBER AND CHARACTER
                                                             ;STATUS IN HIGH BYTE
011334  020504                       CMP   R5,R4             ;ARE EXPECTED AND RECEIVED DATA THE SAME
011336  001401                       BEQ   2$
011340  104000                       HLT                     ;CHARACTER LENGTH, DATA
                                                             ;OR LINE NUMBER ERROR
```

```
2378  011342  104400                  2$:     SCOPE
2379
2380                                          ;CHARACTER LENGTH TEST
2381                                          ;TRANSMIT 1 CHARACTER ON LINE 13
2382                                          ;CHARACTER LENGTH IS 10 BITS
2383                                          ;EXPECTED RECEIVED CHARACTER IS 377
2384                                          ;LINE SPEED IS 9600 BAUD
2385
2386  011344  012767  000340  166424  T60:    MOV     #340,PS         ;DISABLE ALL INTERRUPTS
2387  011352  012767  000400  004206          MOV     #400,ICOUNT     ;SET UP FOR 400 ITERATIONS
2388  011360  012767  011472  004174          MOV     #2$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
2389  011366  012777  004000  004124          MOV     #BIT11,@DHSCR   ;MASTER CLEAR INTERFACE
2390  011374  012767  000377  004216          MOV     #377,TDATA      ;CHARACTER TO BE TRANSMITTED = 377(OCTAL)
2391  011402  012777  000013  004110          MOV     #13,@DHSCR      ;SELECT LINE 13
2392  011410  012777  177777  004112          MOV     #-1,@DHBC       ;SET UP TO TRANSMIT 1 BYTE
2393  011416  012777  015620  004102          MOV     #TDATA,@DHBA    ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
2394  011424  012777  033500  004072          MOV     #33500,@DHLPR   ;SET LINE SPEED FOR 9600 BAUD
2395  011432  052777  000003  004064          BIS     #3,@DHLPR       ;SET CHARACTER LENGTH FOR 10 BITS
2396  011440  012777  004000  004064          MOV     #4000,@DHBAR    ;START TRANSMITTER
2397  011446  105777  004046          1$:     TSTB    @DHSCR          ;WAIT TO RECEIVE CHARACTER
2398  011452  100375                          BPL     1$
2399  011454  017704  004042                  MOV     @DHNRC,R4       ;(R4)=RECEIVED CHARACTER
2400                                                                  ;IN LOW BYTE, AND LINE NUMBER AND
2401                                                                  ;CHARACTER STATUS IN HIGH BYTE
2402  011460  012705  105777                  MOV     #105777,R5      ;(R5)=EXPECTED CHARACTER IN LOW BYTE
2403                                                                  ;AND LINE NUMBER AND CHARACTER
2404                                                                  ;STATUS IN HIGH BYTE
2405  011464  020504                          CMP     R5,R4           ;ARE EXPECTED AND RECEIVED DATA THE SAME
2406  011466  001401                          BEQ     2$
2407  011470  104000                          HLT                     ;CHARACTER LENGTH, DATA
2408                                                                  ;OR LINE NUMBER ERROR
2409  011472  104400                  2$:     SCOPE
2410
2411                                          ;CHARACTER LENGTH TEST
2412                                          ;TRANSMIT 1 CHARACTER ON LINE 14
2413                                          ;CHARACTER LENGTH IS 5 BITS
2414                                          ;EXPECTED RECEIVED CHARACTER IS 37
2415                                          ;LINE SPEED IS 9600 BAUD
2416
2417  011474  012767  000340  166274  T61:    MOV     #340,PS         ;DISABLE ALL INTERRUPTS
2418  011502  012767  000400  004056          MOV     #400,ICOUNT     ;SET UP FOR 400 ITERATIONS
2419  011510  012767  011622  004044          MOV     #2$,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
2420  011516  012777  004000  003774          MOV     #BIT11,@DHSCR   ;MASTER CLEAR INTERFACE
2421  011524  012767  000037  004066          MOV     #37,TDATA       ;CHARACTER TO BE TRANSMITTED = 37(OCTAL)
2422  011532  012777  000014  003760          MOV     #14,@DHSCR      ;SELECT LINE 14
2423  011540  012777  177777  003762          MOV     #-1,@DHBC       ;SET UP TO TRANSMIT 1 BYTE
2424  011546  012777  015620  003752          MOV     #TDATA,@DHBA    ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
2425  011554  012777  033500  003742          MOV     #33500,@DHLPR   ;SET LINE SPEED FOR 9600 BAUD
2426  011562  052777  000000  003734          BIS     #0,@DHLPR       ;SET CHARACTER LENGTH FOR 5 BITS
2427  011570  012777  010000  003734          MOV     #10000,@DHBAR   ;START TRANSMITTER
2428  011576  105777  003716          1$:     TSTB    @DHSCR          ;WAIT TO RECEIVE CHARACTER
2429  011602  100375                          BPL     1$
2430  011604  017704  003712                  MOV     @DHNRC,R4       ;(R4)=RECEIVED CHARACTER
2431                                                                  ;IN LOW BYTE, AND LINE NUMBER AND
2432                                                                  ;CHARACTER STATUS IN HIGH BYTE
2433  011610  012705  106037                  MOV     #106037,R5      ;(R5)=EXPECTED CHARACTER IN LOW BYTE
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2434                                                                    ;AND LINE NUMBER AND CHARACTER
2435                                                                    ;STATUS IN HIGH BYTE
2436  011614  020504                        CMP     R5,R4               ;ARE EXPECTED AND RECEIVED DATA THE SAME
2437  011616  001401                        BEQ     2$
2438  011620  104000                        HLT                         ;CHARACTER LENGTH, DATA
2439                                                                    ;OR LINE NUMBER ERROR
2440  011622  104400              2$:       SCOPE
2441
2442                                        ;CHARACTER LENGTH TEST
2443                                        ;TRANSMIT 1 CHARACTER ON LINE 14
2444                                        ;CHARACTER LENGTH IS 6 BITS
2445                                        ;EXPECTED RECEIVED CHARACTER IS 77
2446                                        ;LINE SPEED IS 9600 BAUD
2447
2448  011624  012767  000340  166144  T62:  MOV     #340,PS             ;DISABLE ALL INTERRUPTS
2449  011632  012767  000400  003726        MOV     #400,ICOUNT         ;SET UP FOR 400 ITERATIONS
2450  011640  012767  011752  003714        MOV     #2$,ESCAPE          ;SET UP TO ESCAPE TO NEXT TEST
2451  011646  012777  004000  003644        MOV     #BIT11,@DHSCR       ;MASTER CLEAR INTERFACE
2452  011654  012767  000077  003736        MOV     #77,TDATA           ;CHARACTER TO BE TRANSMITTED = 77(OCTAL)
2453  011662  012777  000014  003630        MOV     #14,@DHSCR          ;SELECT LINE 14
2454  011670  012777  177777  003632        MOV     #-1,@DHBC           ;SET UP TO TRANSMIT 1 BYTE
2455  011676  012777  015620  003622        MOV     #TDATA,@DHBA        ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
2456  011704  012777  033500  003612        MOV     #33500,@DHLPR       ;SET LINE SPEED FOR 9600 BAUD
2457  011712  052777  000001  003604        BIS     #1,@DHLPR           ;SET CHARACTER LENGTH FOR 6 BITS
2458  011720  012777  010000  003604        MOV     #10000,@DHBAR       ;START TRANSMITTER
2459  011726  105777  003566        1$:     TSTB    @DHSCR              ;WAIT TO RECEIVE CHARACTER
2460  011732  100375                        BPL     1$
2461  011734  017704  003562              MOV     @DHNRC,R4             ;(R4)=RECEIVED CHARACTER
2462                                                                    ;IN LOW BYTE, AND LINE NUMBER AND
2463                                                                    ;CHARACTER STATUS IN HIGH BYTE
2464  011740  012705  106077              MOV     #106077,R5            ;(R5)=EXPECTED CHARACTER IN LOW BYTE
2465                                                                    ;AND LINE NUMBER AND CHARACTER
2466                                                                    ;STATUS IN HIGH BYTE
2467  011744  020504                      CMP     R5,R4                 ;ARE EXPECTED AND RECEIVED DATA THE SAME
2468  011746  001401                      BEQ     2$
2469  011750  104000                      HLT                           ;CHARACTER LENGTH, DATA
2470                                                                    ;OR LINE NUMBER ERROR
2471  011752  104400              2$:     SCOPE
2472
2473                                      ;CHARACTER LENGTH TEST
2474                                      ;TRANSMIT 1 CHARACTER ON LINE 14
2475                                      ;CHARACTER LENGTH IS 7 BITS
2476                                      ;EXPECTED RECEIVED CHARACTER IS 177
2477                                      ;LINE SPEED IS 9600 BAUD
2478
2479  011754  012767  000340  166014  T63:  MOV     #340,PS             ;DISABLE ALL INTERRUPTS
2480  011762  012767  000400  003576        MOV     #400,ICOUNT         ;SET UP FOR 400 ITERATIONS
2481  011770  012767  012102  003564        MOV     #2$,ESCAPE          ;SET UP TO ESCAPE TO NEXT TEST
2482  011776  012777  004000  003514        MOV     #BIT11,@DHSCR       ;MASTER CLEAR INTERFACE
2483  012004  012767  000177  003606        MOV     #177,TDATA          ;CHARACTER TO BE TRANSMITTED = 177(OCTAL)
2484  012012  012777  000014  003500        MOV     #14,@DHSCR          ;SELECT LINE 14
2485  012020  012777  177777  003502        MOV     #-1,@DHBC           ;SET UP TO TRANSMIT 1 BYTE
2486  012026  012777  015620  003472        MOV     #TDATA,@DHBA        ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
2487  012034  012777  033500  003462        MOV     #33500,@DHLPR       ;SET LINE SPEED FOR 9600 BAUD
2488  012042  052777  000002  003454        BIS     #2,@DHLPR           ;SET CHARACTER LENGTH FOR 7 BITS
2489  012050  012777  010000  003454        MOV     #10000,@DHBAR       ;START TRANSMITTER
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2490  012056  105777  003436          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
2491  012062  100375                          BPL     1$
2492  012064  017704  003432                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
2493                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
2494                                                                          ;CHARACTER STATUS IN HIGH BYTE
2495  012070  012705  106177                  MOV     #106177,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
2496                                                                          ;AND LINE NUMBER AND CHARACTER
2497                                                                          ;STATUS IN HIGH BYTE
2498  012074  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
2499  012076  001401                          BEQ     2$
2500  012100  104000                          HLT                             ;CHARACTER LENGTH, DATA
2501                                                                          ;OR LINE NUMBER ERROR
2502  012102  104400          2$:     SCOPE
2503
2504                                  ;CHARACTER LENGTH TEST
2505                                  ;TRANSMIT 1 CHARACTER ON LINE 14
2506                                  ;CHARACTER LENGTH IS 10 BITS
2507                                  ;EXPECTED RECEIVED CHARACTER IS 377
2508                                  ;LINE SPEED IS 9600 BAUD
2509
2510  012104  012767  000340  165664  T64:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2511  012112  012767  000400  003446          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
2512  012120  012767  012232  003434          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2513  012126  012777  004000  003364          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2514  012134  012767  000377  003456          MOV     #377,TDATA              ;CHARACTER TO BE TRANSMITTED = 377(OCTAL)
2515  012142  012777  000014  003350          MOV     #14,@DHSCR              ;SELECT LINE 14
2516  012150  012777  177777  003352          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
2517  012156  012777  015620  003342          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
2518  012164  012777  033500  003332          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
2519  012172  052777  000003  003324          BIS     #3,@DHLPR               ;SET CHARACTER LENGTH FOR 10 BITS
2520  012200  012777  010000  003324          MOV     #10000,@DHBAR           ;START TRANSMITTER
2521  012206  105777  003306          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
2522  012212  100375                          BPL     1$
2523  012214  017704  003302                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
2524                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
2525                                                                          ;CHARACTER STATUS IN HIGH BYTE
2526  012220  012705  106377                  MOV     #106377,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
2527                                                                          ;AND LINE NUMBER AND CHARACTER
2528                                                                          ;STATUS IN HIGH BYTE
2529  012224  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
2530  012226  001401                          BEQ     2$
2531  012230  104000                          HLT                             ;CHARACTER LENGTH, DATA
2532                                                                          ;OR LINE NUMBER ERROR
2533  012232  104400          2$:     SCOPE
2534
2535                                  ;CHARACTER LENGTH TEST
2536                                  ;TRANSMIT 1 CHARACTER ON LINE 15
2537                                  ;CHARACTER LENGTH IS 5 BITS
2538                                  ;EXPECTED RECEIVED CHARACTER IS 37
2539                                  ;LINE SPEED IS 9600 BAUD
2540
2541  012234  012767  000340  165534  T65:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2542  012242  012767  000400  003316          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
2543  012250  012767  012362  003304          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2544  012256  012777  004000  003234          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2545  012264  012767  000037  003326          MOV     #37,TDATA               ;CHARACTER TO BE TRANSMITTED = 37(OCTAL)
```

```
2546  012272  012777  000015  003220          MOV     #15,@DHSCR              ;SELECT LINE 15
2547  012300  012777  177777  003222          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
2548  012306  012777  015620  003212          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
2549  012314  012777  033500  003202          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
2550  012322  052777  000000  003174          BIS     #0,@DHLPR               ;SET CHARACTER LENGTH FOR 5 BITS
2551  012330  012777  020000  003174          MOV     #20000,@DHBAR           ;START TRANSMITTER
2552  012336  105777  003156          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
2553  012342  100375                          BPL     1$
2554  012344  017704  003152                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
2555                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
2556                                                                          ;CHARACTER STATUS IN HIGH BYTE
2557  012350  012705  106437                  MOV     #106437,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
2558                                                                          ;AND LINE NUMBER AND CHARACTER
2559                                                                          ;STATUS IN HIGH BYTE
2560  012354  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
2561  012356  001401                          BEQ     2$
2562  012360  104000                          HLT                             ;CHARACTER LENGTH, DATA
2563                                                                          ;OR LINE NUMBER ERROR
2564  012362  104400          2$:     SCOPE
2565
2566                                  ;CHARACTER LENGTH TEST
2567                                  ;TRANSMIT 1 CHARACTER ON LINE 15
2568                                  ;CHARACTER LENGTH IS 6 BITS
2569                                  ;EXPECTED RECEIVED CHARACTER IS 77
2570                                  ;LINE SPEED IS 9600 BAUD
2571
2572  012364  012767  000340  165404  T66:     MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2573  012372  012767  000400  003166          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
2574  012400  012767  012512  003154          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2575  012406  012777  004000  003104          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2576  012414  012767  000077  003176          MOV     #77,TDATA               ;CHARACTER TO BE TRANSMITTED = 77(OCTAL)
2577  012422  012777  000015  003070          MOV     #15,@DHSCR              ;SELECT LINE 15
2578  012430  012777  177777  003072          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
2579  012436  012777  015620  003062          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
2580  012444  012777  033500  003052          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
2581  012452  052777  000001  003044          BIS     #1,@DHLPR               ;SET CHARACTER LENGTH FOR 6 BITS
2582  012460  012777  020000  003044          MOV     #20000,@DHBAR           ;START TRANSMITTER
2583  012466  105777  003026          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
2584  012472  100375                          BPL     1$
2585  012474  017704  003022                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
2586                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
2587                                                                          ;CHARACTER STATUS IN HIGH BYTE
2588  012500  012705  106477                  MOV     #106477,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
2589                                                                          ;AND LINE NUMBER AND CHARACTER
2590                                                                          ;STATUS IN HIGH BYTE
2591  012504  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
2592  012506  001401                          BEQ     2$
2593  012510  104000                          HLT                             ;CHARACTER LENGTH, DATA
2594                                                                          ;OR LINE NUMBER ERROR
2595  012512  104400          2$:     SCOPE
2596
2597                                  ;CHARACTER LENGTH TEST
2598                                  ;TRANSMIT 1 CHARACTER ON LINE 15
2599                                  ;CHARACTER LENGTH IS 7 BITS
2600                                  ;EXPECTED RECEIVED CHARACTER IS 177
2601                                  ;LINE SPEED IS 9600 BAUD
```

```
2602
2603  012514  012767  000340  165254  T67:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2604  012522  012767  000400  003036          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
2605  012530  012767  012642  003024          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2606  012536  012777  004000  002754          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2607  012544  012767  000177  003046          MOV     #177,TDATA              ;CHARACTER TO BE TRANSMITTED = 177(OCTAL)
2608  012552  012777  000015  002740          MOV     #15,@DHSCR              ;SELECT LINE 15
2609  012560  012777  177777  002742          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
2610  012566  012777  015620  002732          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
2611  012574  012777  033500  002722          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
2612  012602  052777  000002  002714          BIS     #2,@DHLPR               ;SET CHARACTER LENGTH FOR 7 BITS
2613  012610  012777  020000  002714          MOV     #20000,@DHBAR           ;START TRANSMITTER
2614  012616  105777  002676          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
2615  012622  100375                          BPL     1$
2616  012624  017704  002672                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
2617                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
2618                                                                          ;CHARACTER STATUS IN HIGH BYTE
2619  012630  012705  106577                  MOV     #106577,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
2620                                                                          ;AND LINE NUMBER AND CHARACTER
2621                                                                          ;STATUS IN HIGH BYTE
2622  012634  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
2623  012636  001401                          BEQ     2$
2624  012640  104000                          HLT                             ;CHARACTER LENGTH, DATA
2625                                                                          ;OR LINE NUMBER ERROR
2626  012642  104400          2$:     SCOPE
2627
2628                                          ;CHARACTER LENGTH TEST
2629                                          ;TRANSMIT 1 CHARACTER ON LINE 15
2630                                          ;CHARACTER LENGTH IS 10 BITS
2631                                          ;EXPECTED RECEIVED CHARACTER IS 377
2632                                          ;LINE SPEED IS 9600 BAUD
2633
2634  012644  012767  000340  165124  T70:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2635  012652  012767  000400  002706          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
2636  012660  012767  012772  002674          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2637  012666  012777  004000  002624          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2638  012674  012767  000377  002716          MOV     #377,TDATA              ;CHARACTER TO BE TRANSMITTED = 377(OCTAL)
2639  012702  012777  000015  002610          MOV     #15,@DHSCR              ;SELECT LINE 15
2640  012710  012777  177777  002612          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
2641  012716  012777  015620  002602          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
2642  012724  012777  033500  002572          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
2643  012732  052777  000003  002564          BIS     #3,@DHLPR               ;SET CHARACTER LENGTH FOR 10 BITS
2644  012740  012777  020000  002564          MOV     #20000,@DHBAR           ;START TRANSMITTER
2645  012746  105777  002546          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
2646  012752  100375                          BPL     1$
2647  012754  017704  002542                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
2648                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
2649                                                                          ;CHARACTER STATUS IN HIGH BYTE
2650  012760  012705  106777                  MOV     #106777,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
2651                                                                          ;AND LINE NUMBER AND CHARACTER
2652                                                                          ;STATUS IN HIGH BYTE
2653  012764  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
2654  012766  001401                          BEQ     2$
2655  012770  104000                          HLT                             ;CHARACTER LENGTH, DATA
2656                                                                          ;OR LINE NUMBER ERROR
2657  012772  104400          2$:     SCOPE
```

```
                                        ;CHARACTER LENGTH TEST
                                        ;TRANSMIT 1 CHARACTER ON LINE 16
                                        ;CHARACTER LENGTH IS 5 BITS
                                        ;EXPECTED RECEIVED CHARACTER IS 37
                                        ;LINE SPEED IS 9600 BAUD

013774  012767  000340  164774  T71:  MOV   #340,PS          ;DISABLE ALL INTERRUPTS
013002  012767  000400  002556        MOV   #400,ICOUNT      ;SET UP FOR 400 ITERATIONS
013010  012767  013122  002544        MOV   #2$,ESCAPE       ;SET UP TO ESCAPE TO NEXT TEST
013016  012777  004000  002474        MOV   #BIT11,@DHSCR    ;MASTER CLEAR INTERFACE
013024  012767  000037  002566        MOV   #37,TDATA        ;CHARACTER TO BE TRANSMITTED = 37(OCTAL)
013032  012777  000016  002460        MOV   #16,@DHSCR       ;SELECT LINE 16
013040  012777  177777  002462        MOV   #-1,@DHBC        ;SET UP TO TRANSMIT 1 BYTE
013046  012777  015620  002452        MOV   #TDATA,@DHBA     ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
013054  012777  033500  002442        MOV   #33500,@DHLPR    ;SET LINE SPEED FOR 9600 BAUD
013062  052777  000000  002434        BIS   #0,@DHLPR        ;SET CHARACTER LENGTH FOR 5 BITS
013070  012777  040000  002434        MOV   #40000,@DHBAR    ;START TRANSMITTER
013076  105777  002416          1$:   TSTB  @DHSCR           ;WAIT TO RECEIVE CHARACTER
013102  100375                BPL   1$
013104  017704  002412              MOV   @DHNRC,R4          ;(R4)=RECEIVED CHARACTER
                                                             ;IN LOW BYTE, AND LINE NUMBER AND
                                                             ;CHARACTER STATUS IN HIGH BYTE
013110  012705  107037              MOV   #107037,R5         ;(R5)=EXPECTED CHARACTER IN LOW BYTE
                                                             ;AND LINE NUMBER AND CHARACTER
                                                             ;STATUS IN HIGH BYTE
013114  020504                      CMP   R5,R4              ;ARE EXPECTED AND RECEIVED DATA THE SAME
013116  001401                      BEQ   2$
013120  104000                      HLT                      ;CHARACTER LENGTH, DATA
                                                             ;OR LINE NUMBER ERROR
013122  104400          2$:         SCOPE

                                        ;CHARACTER LENGTH TEST
                                        ;TRANSMIT 1 CHARACTER ON LINE 16
                                        ;CHARACTER LENGTH IS 6 BITS
                                        ;EXPECTED RECEIVED CHARACTER IS 77
                                        ;LINE SPEED IS 9600 BAUD

013124  012767  000340  164644  T72:  MOV   #340,PS          ;DISABLE ALL INTERRUPTS
013132  012767  000400  002426        MOV   #400,ICOUNT      ;SET UP FOR 400 ITERATIONS
013140  012767  013252  002414        MOV   #2$,ESCAPE       ;SET UP TO ESCAPE TO NEXT TEST
013146  012777  004000  002344        MOV   #BIT11,@DHSCR    ;MASTER CLEAR INTERFACE
013154  012767  000077  002436        MOV   #77,TDATA        ;CHARACTER TO BE TRANSMITTED = 77(OCTAL)
013162  012777  000016  002330        MOV   #16,@DHSCR       ;SELECT LINE 16
013170  012777  177777  002332        MOV   #-1,@DHBC        ;SET UP TO TRANSMIT 1 BYTE
013176  012777  015620  002322        MOV   #TDATA,@DHBA     ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
013204  012777  033500  002312        MOV   #33500,@DHLPR    ;SET LINE SPEED FOR 9600 BAUD
013212  052777  000001  002304        BIS   #1,@DHLPR        ;SET CHARACTER LENGTH FOR 6 BITS
013220  012777  040000  002304        MOV   #40000,@DHBAR    ;START TRANSMITTER
013226  105777  002266          1$:   TSTB  @DHSCR           ;WAIT TO RECEIVE CHARACTER
013232  100375                BPL   1$
013234  017704  002262              MOV   @DHNRC,R4          ;(R4)=RECEIVED CHARACTER
                                                             ;IN LOW BYTE, AND LINE NUMBER AND
                                                             ;CHARACTER STATUS IN HIGH BYTE
013240  012705  107077              MOV   #107077,R5         ;(R5)=EXPECTED CHARACTER IN LOW BYTE
                                                             ;AND LINE NUMBER AND CHARACTER
```

```
2714
2715  013244  020504                        CMP     R5,R4                   ;STATUS IN HIGH BYTE
2716  013246  001401                        BEQ     2$                      ;ARE EXPECTED AND RECEIVED DATA THE SAME
2717  013250  104000                        HLT                             ;CHARACTER LENGTH, DATA
2718                                                                        ;OR LINE NUMBER ERROR
2719  013252  104400              2$:       SCOPE
2720
2721                                        ;CHARACTER LENGTH TEST
2722                                        ;TRANSMIT 1 CHARACTER ON LINE 16
2723                                        ;CHARACTER LENGTH IS 7 BITS
2724                                        ;EXPECTED RECEIVED CHARACTER IS 177
2725                                        ;LINE SPEED IS 9600 BAUD
2726
2727  013254  012767  000340  164514  T73:  MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2728  013262  012767  000400  002276        MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
2729  013270  012767  013402  002264        MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2730  013276  012777  004000  002214        MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2731  013304  012767  000177  002306        MOV     #177,TDATA              ;CHARACTER TO BE TRANSMITTED = 177(OCTAL)
2732  013312  012777  000016  002200        MOV     #16,@DHSCR              ;SELECT LINE 16
2733  013320  012777  177777  002202        MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
2734  013326  012777  015620  002172        MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
2735  013334  012777  033500  002162        MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
2736  013342  052777  000002  002154        BIS     #2,@DHLPR               ;SET CHARACTER LENGTH FOR 7 BITS
2737  013350  012777  040000  002154        MOV     #40000,@DHBAR           ;START TRANSMITTER
2738  013356  105777  002136        1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
2739  013362  100375                        BPL     1$
2740  013364  017704  002132                MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
2741                                                                        ;IN LOW BYTE, AND LINE NUMBER AND
2742                                                                        ;CHARACTER STATUS IN HIGH BYTE
2743  013370  012705  107177                MOV     #107177,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
2744                                                                        ;AND LINE NUMBER AND CHARACTER
2745                                                                        ;STATUS IN HIGH BYTE
2746  013374  020504                        CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
2747  013376  001401                        BEQ     2$
2748  013400  104000                        HLT                             ;CHARACTER LENGTH, DATA
2749                                                                        ;OR LINE NUMBER ERROR
2750  013402  104400              2$:       SCOPE
2751
2752                                        ;CHARACTER LENGTH TEST
2753                                        ;TRANSMIT 1 CHARACTER ON LINE 16
2754                                        ;CHARACTER LENGTH IS 10 BITS
2755                                        ;EXPECTED RECEIVED CHARACTER IS 377
2756                                        ;LINE SPEED IS 9600 BAUD
2757
2758  013404  012767  000340  164364  T74:  MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2759  013412  012767  000400  002146        MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
2760  013420  012767  013532  002134        MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2761  013426  012777  004000  002064        MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2762  013434  012767  000377  002156        MOV     #377,TDATA              ;CHARACTER TO BE TRANSMITTED = 377(OCTAL)
2763  013442  012777  000016  002050        MOV     #16,@DHSCR              ;SELECT LINE 16
2764  013450  012777  177777  002052        MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
2765  013456  012777  015620  002042        MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
2766  013464  012777  033500  002032        MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
2767  013472  052777  000003  002024        BIS     #3,@DHLPR               ;SET CHARACTER LENGTH FOR 10 BITS
2768  013500  012777  040000  002024        MOV     #40000,@DHBAR           ;START TRANSMITTER
2769  013506  105777  002006        1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
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2770  013512  100375                          BPL     1$
2771  013514  017704  002002                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
2772                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
2773                                                                          ;CHARACTER STATUS IN HIGH BYTE
2774  013520  012705  107377                  MOV     #107377,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
2775                                                                          ;AND LINE NUMBER AND CHARACTER
2776                                                                          ;STATUS IN HIGH BYTE
2777  013524  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
2778  013526  001401                          BEQ     2$
2779  013530  104000                          HLT                             ;CHARACTER LENGTH, DATA
2780                                                                          ;OR LINE NUMBER ERROR
2781  013532  104400              2$:         SCOPE
2782
2783                                          ;CHARACTER LENGTH TEST
2784                                          ;TRANSMIT 1 CHARACTER ON LINE 17
2785                                          ;CHARACTER LENGTH IS 5 BITS
2786                                          ;EXPECTED RECEIVED CHARACTER IS 37
2787                                          ;LINE SPEED IS 9600 BAUD
2788
2789  013534  012767  000340  164234  T75:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2790  013542  012767  000400  002016          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
2791  013550  012767  013662  002004          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2792  013556  012777  004000  001734          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2793  013564  012767  000037  002026          MOV     #37,TDATA               ;CHARACTER TO BE TRANSMITTED = 37(OCTAL)
2794  013572  012777  000017  001720          MOV     #17,@DHSCR              ;SELECT LINE 17
2795  013600  012777  177777  001722          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
2796  013606  012777  015620  001712          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
2797  013614  012777  033500  001702          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
2798  013622  052777  000000  001674          BIS     #0,@DHLPR               ;SET CHARACTER LENGTH FOR 5 BITS
2799  013630  012777  100000  001674          MOV     #100000,@DHBAR          ;START TRANSMITTER
2800  013636  105777  001656          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
2801  013642  100375                          BPL     1$
2802  013644  017704  001652                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
2803                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
2804                                                                          ;CHARACTER STATUS IN HIGH BYTE
2805  013650  012705  107437                  MOV     #107437,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
2806                                                                          ;AND LINE NUMBER AND CHARACTER
2807                                                                          ;STATUS IN HIGH BYTE
2808  013654  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
2809  013656  001401                          BEQ     2$
2810  013660  104000                          HLT                             ;CHARACTER LENGTH, DATA
2811                                                                          ;OR LINE NUMBER ERROR
2812  013662  104400              2$:         SCOPE
2813
2814                                          ;CHARACTER LENGTH TEST
2815                                          ;TRANSMIT 1 CHARACTER ON LINE 17
2816                                          ;CHARACTER LENGTH IS 6 BITS
2817                                          ;EXPECTED RECEIVED CHARACTER IS 77
2818                                          ;LINE SPEED IS 9600 BAUD
2819
2820  013664  012767  000340  164104  T76:    MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2821  013672  012767  000400  001666          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
2822  013700  012767  014012  001654          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2823  013706  012777  004000  001604          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2824  013714  012767  000077  001676          MOV     #77,TDATA               ;CHARACTER TO BE TRANSMITTED = 77(OCTAL)
2825  013722  012777  000017  001570          MOV     #17,@DHSCR              ;SELECT LINE 17
```

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2826  013730  012777  177777  001572          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
2827  013736  012777  015620  001562          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
2828  013744  012777  033500  001552          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
2829  013752  052777  000001  001544          BIS     #1,@DHLPR               ;SET CHARACTER LENGTH FOR 6 BITS
2830  013760  012777  100000  001544          MOV     #100000,@DHBAR          ;START TRANSMITTER
2831  013766  105777  001526            1$:   TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
2832  013772  100375                          BPL     1$
2833  013774  017704  001522                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
2834                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
2835                                                                          ;CHARACTER STATUS IN HIGH BYTE
2836  014000  012705  107477                  MOV     #107477,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
2837                                                                          ;AND LINE NUMBER AND CHARACTER
2838                                                                          ;STATUS IN HIGH BYTE
2839  014004  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
2840  014006  001401                          BEQ     2$
2841  014010  104000                          HLT                             ;CHARACTER LENGTH, DATA
2842                                                                          ;OR LINE NUMBER ERROR
2843  014012  104400            2$:           SCOPE
2844
2845                                          ;CHARACTER LENGTH TEST
2846                                          ;TRANSMIT 1 CHARACTER ON LINE 17
2847                                          ;CHARACTER LENGTH IS 7 BITS
2848                                          ;EXPECTED RECEIVED CHARACTER IS 177
2849                                          ;LINE SPEED IS 9600 BAUD
2850
2851  014014  012767  000340  163754  T77:   MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
2852  014022  012767  000400  001536          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
2853  014030  012767  014142  001524          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
2854  014036  012777  004000  001454          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
2855  014044  012767  000177  001546          MOV     #177,TDATA              ;CHARACTER TO BE TRANSMITTED = 177(OCTAL)
2856  014052  012777  000017  001440          MOV     #17,@DHSCR              ;SELECT LINE 17
2857  014060  012777  177777  001442          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
2858  014066  012777  015620  001432          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
2859  014074  012777  033500  001422          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
2860  014102  052777  000002  001414          BIS     #2,@DHLPR               ;SET CHARACTER LENGTH FOR 7 BITS
2861  014110  012777  100000  001414          MOV     #100000,@DHBAR          ;START TRANSMITTER
2862  014116  105777  001376            1$:   TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
2863  014122  100375                          BPL     1$
2864  014124  017704  001372                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
2865                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
2866                                                                          ;CHARACTER STATUS IN HIGH BYTE
2867  014130  012705  107577                  MOV     #107577,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
2868                                                                          ;AND LINE NUMBER AND CHARACTER
2869                                                                          ;STATUS IN HIGH BYTE
2870  014134  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
2871  014136  001401                          BEQ     2$
2872  014140  104000                          HLT                             ;CHARACTER LENGTH, DATA
2873                                                                          ;OR LINE NUMBER ERROR
2874  014142  104400            2$:           SCOPE
2875
2876                                          ;CHARACTER LENGTH TEST
2877                                          ;TRANSMIT 1 CHARACTER ON LINE 17
2878                                          ;CHARACTER LENGTH IS 10 BITS
2879                                          ;EXPECTED RECEIVED CHARACTER IS 377
2880                                          ;LINE SPEED IS 9600 BAUD
2881
```

```
 2882  014144  012767  000340  163624  T100:   MOV     #340,PS                 ;DISABLE ALL INTERRUPTS
 2883  014152  012767  000400  001406          MOV     #400,ICOUNT             ;SET UP FOR 400 ITERATIONS
 2884  014160  012767  014272  001374          MOV     #2$,ESCAPE              ;SET UP TO ESCAPE TO NEXT TEST
 2885  014166  012777  004000  001324          MOV     #BIT11,@DHSCR           ;MASTER CLEAR INTERFACE
 2886  014174  012767  000377  001416          MOV     #377,TDATA              ;CHARACTER TO BE TRANSMITTED = 377(OCTAL)
 2887  014202  012777  000017  001310          MOV     #17,@DHSCR              ;SELECT LINE 17
 2888  014210  012777  177777  001312          MOV     #-1,@DHBC               ;SET UP TO TRANSMIT 1 BYTE
 2889  014216  012777  015620  001302          MOV     #TDATA,@DHBA            ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
 2890  014224  012777  033500  001272          MOV     #33500,@DHLPR           ;SET LINE SPEED FOR 9600 BAUD
 2891  014232  052777  000003  001264          BIS     #3,@DHLPR               ;SET CHARACTER LENGTH FOR 10 BITS
 2892  014240  012777  100000  001264          MOV     #100000,@DHBAR          ;START TRANSMITTER
 2893  014246  105777  001246          1$:     TSTB    @DHSCR                  ;WAIT TO RECEIVE CHARACTER
 2894  014252  100375                          BPL     1$
 2895  014254  017704  001242                  MOV     @DHNRC,R4               ;(R4)=RECEIVED CHARACTER
 2896                                                                          ;IN LOW BYTE, AND LINE NUMBER AND
 2897                                                                          ;CHARACTER STATUS IN HIGH BYTE
 2898  014260  012705  107777                  MOV     #107777,R5              ;(R5)=EXPECTED CHARACTER IN LOW BYTE
 2899                                                                          ;AND LINE NUMBER AND CHARACTER
 2900                                                                          ;STATUS IN HIGH BYTE
 2901  014264  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED DATA THE SAME
 2902  014266  001401                          BEQ     2$
 2903  014270  104000                          HLT                             ;CHARACTER LENGTH, DATA
 2904                                                                          ;OR LINE NUMBER ERROR
 2905  014272  104400                  2$:     SCOPE
```

```
2906
2907                                            ;END OF PASS
2908                                            ;TYPE NAME OF TEST
2909                                            ;UPDATE PASS COUNT
2910                                            ;CHECK FOR EXIT TO ACT-11
2911                                            ;RESTART TEST
2912
2913  014274  104401                    EOP:    TYPE                            ;TYPE NAME OF TEST
2914  014276  016220                            MEPASS
2915  014300  005067  001312                   CLR     LAST                    ;CLEAR LAST ERROR PC
2916  014304  005067  001242                   CLR     ERRFLG                  ;CLEAR ERROR FLAG
2917  014310  005267  001240                   INC     PASCNT                  ;UPDATE PASS COUNT
2918  014314  016767  001234  163246          MOV     PASCNT,LIGHTS           ;DISPLAY PASS COUNT
2919  014322  013701  000042                   MOV     @#42,R1                 ;CHECK FOR ACT-11 OR DDP
2920  014326  001405                           BEQ     RESTRT                  ;IF NOT, CONTINUE TESTING
2921  014330  000005                           RESET
2922  014332  004711                LOGICAL:    JSR     PC,(R1)
2923  014334  000240                           NOP
2924  014336  000240                           NOP
2925  014340  000240                           NOP
2926  014342  000167  164634        RESTRT:   JMP     BEGIN
2927
2928                                            ;CHECK FOR LOOP ON CURRENT TEST
2929                                            ;CHECK FOR ITERATION SUPPRESSION
2930
2931  014346  032767  002000  163214  SCOPER:   BIT     #SW10,SWR
2932  014354  001030                           BNE     4$
2933  014356  032767  040000  163204  1$:       BIT     #SW14,SWR
2934  014364  001021                           BNE     3$
2935  014366  032767  004000  163174           BIT     #SW11,SWR
2936  014374  001006                           BNE     2$
2937  014376  005267  001166                   INC     LPCNT
2938  014402  026767  001162  001156           CMP     LPCNT,ICOUNT
2939  014410  001007                           BNE     3$
2940  014412  005067  001152          2$:      CLR     LPCNT
2941  014416  005067  001130                   CLR     ERRFLG
2942  014422  011667  001132                   MOV     (SP),RETURN
2943  014426  000002                           RTI
2944  014430  016716  001124          3$:      MOV     RETURN,(SP)
2945  014434  000002                           RTI
2946  014436  005767  001110          4$:      TST     ERRFLG
2947  014442  001745                           BEQ     1$
2948  014444  000762                           BR      2$
2949
2950                                            ;CHECK FOR FREEZE ON CURRENT DATA
2951
2952  014446  032767  001000  163114  SCOP1R:   BIT     #SW09,SWR
2953  014454  001402                           BEQ     1$
2954  014456  016716  001102                   MOV     FREEZ1,(SP)
2955  014462  000002                  1$:      RTI
```

```
2956
2957                                                    ;ERROR HANDLER
2958
2959  014464  032767  020000  163076  ERRORS: BIT     #SW13,SWR
2960  014472  001051                          BNE     HALTS
2961  014474  021667  001116                  CMP     (SP),LAST
2962  014500  001404                          BEQ     1$
2963  014502  011667  001110                  MOV     (SP),LAST
2964  014506  005067  001040                  CLR     ERRFLG
2965  014512  104406                  1$:     SAVOSP
2966  014514  011605                          MOV     (SP),R5
2967  014516  162705  000002                  SUB     #2,R5
2968  014522  011504                          MOV     (R5),R4
2969  014524  006304                          ASL     R4
2970  014526  006304                          ASL     R4
2971  014530  042704  177001                  BIC     #177001,R4
2972  014534  062704  016330                  ADD     #ERRTAB,R4
2973  014540  012467  000034                  MOV     (R4)+,ERRMSG
2974  014544  011467  000042                  MOV     (R4),DATABP
2975  014550  005767  000776                  TST     ERRFLG
2976  014554  001403                          BEQ     TYPMSG
2977  014556  005767  000030                  TST     DATABP
2978  014562  001007                          BNE     TYPDAT
2979  014564  104402                  TYPMSG: OCTASC
2980  014566  014660                          ERTABO
2981  014570  012767  000001  000754          MOV     #1,ERRFLG
2982  014576  104401                          TYPE
2983  014600  000000                  ERRMSG: 0
2984  014602  005767  000004          TYPDAT: TST     DATABP
2985  014606  001402                          BEQ     RESREG
2986  014610  104402                          OCTASC
2987  014612  000000                  DATABP: 0
2988  014614  104407                  RESREG: RESO5
2989  014616  005767  162746          HALTS:  TST     SWR
2990  014622  100005                          BPL     EXITER
2991  014624  010046                          PUSHRO
2992  014626  016600  000002                  MOV     2(SP),RO
2993  014632  000000                          HALT
2994  014634  012600                          POPRO
2995  014636  005267  000714          EXITER: INC     ERRCNT
2996  014642  032767  002000  162720          BIT     #SW10,SWR
2997  014650  001402                          BEQ     1$
2998  014652  016716  000704                  MOV     ESCAPE,(SP)
2999  014656  000002                  1$:     RTI
3000  014660  000001                  ERTABO: 1
3001  014662     006     002                  .BYTE   6,2
3002  014664  015610                          SAVPC
```

```
3003                                            ;TRAP DISPATCH SERVICE
3004                                            ;ARGUMENT OF TRAP IS EXTRACTED
3005                                            ;AND USED AS OFFSET TO OBTAIN POINTER
3006                                            ;TO SELECTED SUBROUTINE
3007
3008  014666  011646                TRPSRV: MOV     (SP),-(SP)              ;GET PC OF RETURN
3009  014670  162716  000002                SUB     #2,(SP)                 ;=PC OF TRAP
3010  014674  017616  000000                MOV     @(SP),(SP)              ;GET TRP
3011  014700  006316                TRPOK:  ASL     (SP)                    ;MULTIPLY TRAP ARG BY 2
3012  014702  042716  177001                BIC     #177001,(SP)            ;CLEAR UNWANTED BITS
3013  014706  062716  016250                ADD     #TRPTAB,(SP)            ;POINTER TO SUBROUTINE ADDRESS
3014  014712  017616  000000                MOV     @(SP),(SP)              ;SUBROUTINE ADDRESS
3015  014716  000136                        JMP     @(SP)+                  ;GO TO SUBROUTINE
3016
3017                                            ;SAVE PC OF TEST THAT FAILED AND R0-R5
3018
3019  014720  016667  000004  000662  SV05P:  MOV     4(SP),SAVPC
3020
3021                                            ;SAVE R0-R5
3022
3023  014726  010567  000652            SV05:   MOV     R5,SAVR5
3024  014732  010467  000644                    MOV     R4,SAVR4
3025  014736  010367  000636                    MOV     R3,SAVR3
3026  014742  010267  000630                    MOV     R2,SAVR2
3027  014746  010167  000622                    MOV     R1,SAVR1
3028  014752  010067  000614                    MOV     R0,SAVR0
3029  014756  000002                            RTI
3030                                            ;RESTORE R0-R5
3031
3032  014760  016700  000606            RS05:   MOV     SAVR0,R0
3033  014764  016701  000604                    MOV     SAVR1,R1
3034  014770  016702  000602                    MOV     SAVR2,R2
3035  014774  016703  000600                    MOV     SAVR3,R3
3036  015000  016704  000576                    MOV     SAVR4,R4
3037  015004  016705  000574                    MOV     SAVR5,R5
3038  015010  000002                            RTI
```

```
3039
3040                                                    ;TELETYPE OUTPUT ROUTINE
3041
3042  015012  017605  000000          TYPER:  MOV     @(SP),R5
3043  015016  062716  000002                  ADD     #2,(SP)
3044  015022  105777  000466          1$:     TSTB    @TPCSR
3045  015026  100375                          BPL     1$
3046  015030  105715                          TSTB    (R5)
3047  015032  001001                          BNE     2$
3048  015034  000002                          RTI
3049  015036  112577  000454          2$:     MOVB    (R5)+,@TPDBR
3050  015042  000767                          BR      1$
3051
3052                                                    ;ASCII STRING INPUT ROUTINE
3053
3054  015044  017667  000000  000006  INSTRG: MOV     @(SP),MSG
3055  015052  062716  000002                  ADD     #2,(SP)
3056  015056  104401                  INSTR1: TYPE
3057  015060  000000                  MSG:    0
3058  015062  012704  016272                  MOV     #INBUF,R4
3059  015066  012703  000007                  MOV     #7,R3
3060  015072  105777  000412          1$:     TSTB    @TKCSR
3061  015076  100375                          BPL     1$
3062  015100  117714  000406                  MOVB    @TKDBR,(R4)
3063  015104  142714  000200                  BICB    #200,(R4)
3064  015110  122427  000015                  CMPB    (R4)+,#15
3065  015114  001413                          BEQ     INSTR2
3066  015116  117777  000370  000372          MOVB    @TKDBR,@TPDBR
3067  015124  105777  000364          2$:     TSTB    @TPCSR
3068  015130  100375                          BPL     2$
3069  015132  005303                          DEC     R3
3070  015134  001356                          BNE     1$
3071  015136  104401                  INSTRE: TYPE
3072  015140  016124                          MQM
3073  015142  000745                          BR      INSTR1
3074  015144  000002                  INSTR2: RTI
```

```
3075
3076                                        ;CONVERT ASCII STRING TO OCTAL
3077
3078  015146  011605                PARAMS: MOV     (SP),R5
3079  015150  012567  000146               MOV     (R5)+,LOLIM
3080  015154  012567  000144               MOV     (R5)+,HILIM
3081  015160  012567  000142               MOV     (R5)+,DEVADR
3082  015164  112567  000140               MOVB    (R5)+,LOBITS
3083  015170  112567  000135               MOVB    (R5)+,ADRCNT
3084  015174  010516                       MOV     R5,(SP)
3085  015176  005005                PARAM1: CLR     R5
3086  015200  012704  016272               MOV     #INBUF,R4
3087  015204  122714  000015               CMPB    #15,(R4)
3088  015210  001420                       BEQ     PARERR
3089  015212  121427  000060         1$:   CMPB    (R4),#60
3090  015216  002415                       BLT     PARERR
3091  015220  121427  000067               CMPB    (R4),#67
3092  015224  003012                       BGT     PARERR
3093  015226  142714  000060               BICB    #60,(R4)
3094  015232  152405                       BISB    (R4)+,R5
3095  015234  122714  000015               CMPB    #15,(R4)
3096  015240  001406                       BEQ     LIMITS
3097  015242  006305                       ASL     R5
3098  015244  006305                       ASL     R5
3099  015246  006305                       ASL     R5
3100  015250  000760                       BR      1$
3101  015252  104404                PARERR: INSTER
3102  015254  000750                       BR      PARAM1
3103
3104                                        ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
3105
3106  015256  020567  000042         LIMITS: CMP     R5,HILIM
3107  015262  101373                       BHI     PARERR
3108  015264  020567  000032               CMP     R5,LOLIM
3109  015270  103770                       BLO     PARERR
3110  015272  136705  000032               BITB    LOBITS,R5
3111  015276  001365                       BNE     PARERR
3112
3113                                        ;STORE NUMBER AT SPECIFIED ADDRESS
3114
3115  015300  016704  000022               MOV     DEVADR,R4
3116  015304  010524                1$:    MOV     R5,(R4)+
3117  015306  062705  000002               ADD     #2,R5
3118  015312  105367  000013               DECB    ADRCNT
3119  015316  001372                       BNE     1$
3120  015320  000002                       RTI
3121  015322  000000                LOLIM:  0
3122  015324  000000                HILIM:  0
3123  015326  000000                DEVADR: 0
3124  015330  000000                LOBITS: 0
3125          015331                ADRCNT=LOBITS+1
```

```
3126
3127                                        ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
3128
3129  015332  104401              OCTASN:   TYPE
3130  015334  016130                        MCRLF
3131  015336  017601  000000                MOV     @(SP),R1
3132  015342  062716  000002                ADD     #2,(SP)
3133  015346  012167  000130                MOV     (R1)+,WRDCNT
3134  015352  112167  000126      1$:       MOVB    (R1)+,CHRCNT
3135  015356  112167  000123                MOVB    (R1)+,SPACNT
3136  015362  013167  000120                MOV     @(R1)+,BINWRD
3137  015366  016704  000114      2$:       MOV     BINWRD,R4
3138  015372  116705  000106                MOVB    CHRCNT,R5
3139  015376  012700  016304                MOV     #TEMP,R0
3140  015402  010403                3$:       MOV     R4,R3
3141  015404  042703  177770                BIC     #177770,R3
3142  015410  062703  000260                ADD     #260,R3
3143  015414  110320                        MOVB    R3,(R0)+
3144  015416  006204                        ASR     R4
3145  015420  006204                        ASR     R4
3146  015422  006204                        ASR     R4
3147  015424  005305                        DEC     R5
3148  015426  001365                        BNE     3$
3149  015430  012703  016316                MOV     #MDATA,R3
3150  015434  114023                4$:       MOVB    -(R0),(R3)+
3151  015436  105367  000042                DECB    CHRCNT
3152  015442  001374                        BNE     4$
3153  015444  105767  000035                TSTB    SPACNT
3154  015450  001405                        BEQ     6$
3155  015452  112723  000240      5$:       MOVB    #240,(R3)+
3156  015456  105367  000023                DECB    SPACNT
3157  015462  001373                        BNE     5$
3158  015464  105013                6$:       CLRB    (R3)
3159  015466  104401                        TYPE
3160  015470  016316                        MDATA
3161  015472  005367  000004                DEC     WRDCNT
3162  015476  001325                        BNE     1$
3163  015500  000002                        RTI
3164  015502  000000              WRDCNT:   0
3165  015504  000000              CHRCNT:   0
3166          015505              SPACNT=CHRCNT+1
3167  015506  000000              BINWRD:   0
```

```
3168                                        ;INDIRECT POINTERS
3169
3170  015510  177560            TKCSR:  177560
3171  015512  177562            TKDBR:  177562
3172  015514  177564            TPCSR:  177564
3173  015516  177566            TPDBR:  177566
3174  015520  000000            DHSCR:  0
3175  015522  000000            DHNRC:  0
3176  015524  000000            DHLPR:  0
3177  015526  000000            DHBA:   0
3178  015530  000000            DHBC:   0
3179  015532  000000            DHBAR:  0
3180  015534  000000            DHBCR:  0
3181  015536  000000            DHSSR:  0
3182  015540  000000            DHSLR:  0
3183  015542  000000            DHRVEC: 0
3184  015544  000000            DHRLVL: 0
3185  015546  000000            DHTVEC: 0
3186  015550  000000            DHTLVL: 0
3187                                        ;PROGRAM VARIABLES
3188
3189  015552  000000            ERRFLG: 0               ;ERROR FLAG
3190  015554  000000            PASCNT: 0               ;PASS COUNT
3191  015556  000000            ERRCNT: 0               ;ERROR COUNT
3192  015560  000000            RETURN: 0               ;SCOPE RETURN ADDRESS FOR TEST LOOPING
3193  015562  000000            ESCAPE: 0               ;ADDRESS FOR ERROR ESCAPE
3194  015564  000000            FREEZ1: 0               ;DATA LOOPING RETURN ADDRESS
3195  015566  000000            ICOUNT: 0               ;ITERATION COUNT FOR TEST IN PROGRESS
3196  015570  000000            LPCNT:  0               ;NUMBER OF ITERATIONS THIS TEST
3197  015572  000000            SAVR0:  0               ;R0 SAVE AREA
3198  015574  000000            SAVR1:  0               ;R1 SAVE AREA
3199  015576  000000            SAVR2:  0               ;R2 SAVE AREA
3200  015600  000000            SAVR3:  0               ;R3 SAVE ARE
3201  015602  000000            SAVR4:  0               ;R4 SAVE AREA
3202  015604  000000            SAVR5:  0               ;R5 SAVE AREA
3203  015606  000000            SAVSP:  0               ;STACK POINTER SAVE AREA
3204  015610  000000            SAVPC:  0               ;CALLING ROUTINE SAVE AREA
3205  015612  000000            INIFLG: 0               ;PROGRAM INITIALIZATION FLAG
3206  015614  000000            STFLG:  0               ;PROGRAM START FLAG
3207  015616  000000            LAST:   0               ;LAST ERROR PC
3208  015620  000000            TDATA:  0
```

```
3209                                            ;ENTER HERE ON POWER FAILURE
3210
3211
3212  015622  010046                    PFAIL:  MOV     R0,-(SP)                ;SAVE R0-R5 ON PROCESSOR STACK
3213  015624  010146                            MOV     R1,-(SP)
3214  015626  010246                            MOV     R2,-(SP)
3215  015630  010346                            MOV     R3,-(SP)
3216  015632  010446                            MOV     R4,-(SP)
3217  015634  010546                            MOV     R5,-(SP)
3218  015636  016746  162162                    MOV     24,-(SP)
3219  015642  010667  177740                    MOV     SP,SAVSP                ;SAVE STACK POINTER
3220  015646  012767  015660  162150            MOV     #RESTART,24             ;SET UP FOR POWER UP TRAP
3221  015654  000000                            HALT                            ;HALT ON POWER DOWN NORMAL
3222  015656  000777                            BR      .
3223
3224                                            ;PROCESSOR WILL TRAP HERE WHEN POWER IS RESTORED
3225
3226  015660  016706  177722            RESTAR: MOV     SAVSP,SP                ;RESTORE STACK POINTER
3227  015664  012605                            MOV     (SP)+,R5                ;RESTORE R0-R5
3228  015666  012604                            MOV     (SP)+,R4
3229  015670  012603                            MOV     (SP)+,R3
3230  015672  012602                            MOV     (SP)+,R2
3231  015674  012601                            MOV     (SP)+,R1
3232  015676  012600                            MOV     (SP)+,R0
3233  015700  012767  015622  162116            MOV     #PFAIL,24               ;SET UP FOR POWER FAILURE
3234  015706  012767  000340  162062            MOV     #340,PS
3235  015714  012705  016620                    MOV     #STACK,SP
3236  015720  005067  000360                    CLR     TEMP
3237  015724  005267  000354                    INC     TEMP
3238  015730  001375                            BNE     .-4
3239  015732  104402                            OCTASC
3240  015734  015756                            PFTAB
3241  015736  104401                            TYPE
3242  015740  016133                            MPFAIL
3243  015742  005067  177604                    CLR     ERRFLG
3244  015746  005067  177644                    CLR     LAST
3245  015752  000177  177602                    JMP     @RETURN
3246  015756  000001                    PFTAB:  1
3247  015760  000006  000002                    6.2
3248  015764  000207                            RETURN
```

```
3249  015766  005015  042012  030510  MTITLE: .ASCIZ  <15><12><12>/DH11 CHARACTER LENGTH AND BASIC DATA TEST //<15><12>
3250  015774  020061  044103  051101
3251  016002  041501  042524  020122
3252  016010  042514  043516  044124
3253  016016  040440  042116  041040
3254  016024  051501  041511  042040
3255  016032  052101  020101  042524
3256  016040  052123  006440  000012
3257  016046  005015  042526  052103  MVECTO: .ASCIZ  <15><12>/VECTOR ADDRESS-/
3258  016054  051117  040440  042104
3259  016062  042522  051523  000055
3260  016070  005015  047503  052116  MREGAD: .ASCIZ  <15><12>/CONTROL REGISTER ADDRESS-/
3261  016076  047522  020114  042522
3262  016104  044507  052123  051105
3263  016112  040440  042104  042522
3264  016120  051523  000055
3265  016124  020040  000077          MQM:    .ASCIZ  /  ?/
3266  016130  005015     000          MCRLF:  .ASCIZ  <15><12>
3267  016133     040  050040  053517  MPFAIL: .ASCIZ  /  POWER FAILURE, PROGRAM RESTART AT TEST IN PROGRESS/
3268  016140  051105  043040  044501
3269  016146  052514  042522  020054
3270  016154  051120  043517  040522
3271  016162  020115  042522  052123
3272  016170  051101  020124  052101
3273  016176  052040  051505  020124
3274  016204  047111  050040  047522
3275  016212  051107  051505  000123
3276  016220  005015  055104  044104  MEPASS: .ASCIZ  <15><12>/DZDHE/
3277  016226  000105
3278  016230  005015  000122          MR:     .ASCIZ  <15><12>/R/
3279  016234  005015  042524  052123  MTSTPC: .ASCIZ  <15><12>/TEST PC-/
3280  016242  050040  026503     000
3281          016250                  .EVEN
3282
3283                                  ;TABLE OF POINTERS FOR TRAP DECODING
3284
3285  016250  014346                  TRPTAB: SCOPER
3286  016252  015012                          TYPER
3287  016254  015332                          OCTASN
3288  016256  015044                          INSTRG
3289  016260  015136                          INSTRE
3290  016262  015146                          PARAMS
3291  016264  014720                          SVOSP
3292  016266  014760                          RSOS
3293  016270  014446                          SCOP1R
3294
3295                                  ;BUFFERS FOR INPUT-OUTPUT
3296
3297  016272  000000                  INBUF:  0
3298          016304                  .=.+10
3299  016304  000000                  TEMP:   0
3300          016316                  .=.+10
3301  016316  000000                  MDATA:  0
3302          016330                  .=.+10
3303
3304                                  ;TABLE OF POINTERS TO ERROR MESSAGES AND DATA
```

```
 3305
 3306  016330                          ERRTAB:
 3307  016330  016334                            EM1
 3308  016332  016406                            DT1
 3309  016334  044103  051101  041501  EM1:      .ASCIZ  /CHARACTER LENGTH ERROR/<15><12>/EXP     REC     /
 3310  016342  042524  020122  042514
 3311  016350  043516  044124  042440
 3312  016356  051122  051117  005015
 3313  016364  054105  020120  020040
 3314  016372  020040  042522  020103
 3315  016400  020040  020040     000
 3316          016406                    .EVEN
 3317  016406  000002                    DT1:    2
 3318  016410     006     002            .BYTE   6,2
 3319  016412  015604                            SAVR5
 3320  016414     006     000            .BYTE   6,0
 3321  016416  015602                            SAVR4
 3322  016420  000000                    ENDCOD: 0
 3323          000001                    .END
```

```
ADRCNT= 015331          3083*   3118*   3125#
BEGIN   001202           868     897     903#   2926
BINWRD  015506          3136*   3137    3167#
BITX  = 000000           922#    953     984    1015   1046#  1077   1108   1139   1170#  1201   1232   1263   1294#
                        1325    1356    1387    1418#  1449   1480   1511   1542#  1573   1604   1635   1666#  1697
                        1728    1759    1790#   1821   1852   1883   1914#  1945   1976   2007   2038#  2069   2100
                        2131    2162#   2193    2224   2255   2286#  2317   2348   2379   2410#  2441   2472   2503
                        2534#   2565    2596    2627   2658#  2689   2720   2751   2782#  2813   2844   2875   2906#
BIT00 = 000001           554#
BIT01 = 000002           553#
BIT02 = 000004           552#
BIT03 = 000010           551#
BIT04 = 000020           550#
BIT05 = 000040           549#
BIT06 = 000100           548#
BIT07 = 000200           547#
BIT08 = 000400           546#
BIT09 = 001000           545#
BIT10 = 002000           544#
BIT11 = 004000           543#    932     963     994   1025   1056   1087   1118   1149   1180   1211   1242   1273
                        1304    1335    1366    1397   1428   1459   1490   1521   1552   1583   1614   1645   1676
                        1707    1738    1769    1800   1831   1862   1893   1924   1955   1986   2017   2048   2079
                        2110    2141    2172    2203   2234   2265   2296   2327   2358   2389   2420   2451   2482
                        2513    2544    2575    2606   2637   2668   2699   2730   2761   2792   2823   2954   2885
BIT12 = 010000           542#
BIT13 = 020000           541#
BIT14 = 040000           540#
BIT15 = 100000           539#
CHRCNT  015504          3134*   3138    3151*   3165#  3166
CLENGT= 000011           922#
CODEX = 000777           922#
DATABP  014612          2974*   2977    2984    2987#
DATAR = 107777           922#    953#    984#   1015#  1046#  1077#  1108#  1139#  1170#  1201#  1232#  1263#  1294#
                        1325#   1356#   1387#   1418#  1449#  1480#  1511#  1542#  1573#  1604#  1635#  1666#  1697#
                        1728#   1759#   1790#   1821#  1852#  1883#  1914#  1945#  1976#  2007#  2038#  2069#  2100#
                        2131#   2162#   2193#   2224#  2255#  2286#  2317#  2348#  2379#  2410#  2441#  2472#  2503#
                        2534#   2565#   2596#   2627#  2658#  2689#  2720#  2751#  2782#  2813#  2844#  2875#
DEVADR  015326          3081*   3115    3123#
DHBA    015526           936*    967*    998*   1029*  1060*  1091*  1122*  1153*  1184*  1215*  1246*  1277*  1308*
                        1339*   1370*   1401*   1432*  1463*  1494*  1525*  1556*  1587*  1618*  1649*  1680*  1711*
                        1742*   1773*   1804*   1835*  1866*  1897*  1928*  1959*  1990*  2021*  2052*  2083*  2114*
                        2145*   2176*   2207*   2238*  2269*  2300*  2331*  2362*  2393*  2424*  2455*  2486*  2517*
                        2548*   2579*   2610*   2641*  2672*  2703*  2734*  2765*  2796*  2827*  2858*  2889*  3177#
DHBAR   015532           939*    970*   1001*   1032*  1063*  1094*  1125*  1156*  1187*  1218*  1249*  1280*  1311*
                        1342*   1373*   1404*   1435*  1466*  1497*  1528*  1559*  1590*  1621*  1652*  1683*  1714*
                        1745*   1776*   1807*   1838*  1869*  1900*  1931*  1962*  1993*  2024*  2055*  2086*  2117*
                        2148*   2179*   2210*   2241*  2272*  2303*  2334*  2365*  2396*  2427*  2458*  2489*  2520*
                        2551*   2582*   2613*   2644*  2675*  2706*  2737*  2768*  2799*  2830*  2861*  2892*  3179#
DHBC    015530           935*    966*    997*   1028*  1059*  1090*  1121*  1152*  1183*  1214*  1245*  1276*  1307*
                        1338*   1369*   1400*   1431*  1462*  1493*  1524*  1555*  1586*  1617*  1648*  1679*  1710*
                        1741*   1772*   1803*   1834*  1865*  1896*  1927*  1958*  1989*  2020*  2051*  2082*  2113*
                        2144*   2175*   2206*   2237*  2268*  2299*  2330*  2361*  2392*  2423*  2454*  2485*  2516*
                        2547*   2578*   2609*   2640*  2671*  2702*  2733*  2764*  2795*  2826*  2857*  2888*  3178#
DHBCR   015534          3180#
DHLPR   015524           937*    938*    968*    969*   999*  1000*  1030*  1031*  1061*  1062*  1092*  1093*  1123*
                        1124*   1154*   1155*   1185*  1186*  1216*  1217*  1247*  1248*  1278*  1279*  1309*  1310*
```

```
                    1736*   1767*   1798*   1829*   1860*   1891*   1922*   1953*   1984*   2015*   2046*   2077*   2108*
                    2139*   2170*   2201*   2232*   2263*   2294*   2325*   2356*   2387*   2418*   2449*   2480*   2511*
                    2542*   2573*   2604*   2635*   2666*   2697*   2728*   2759*   2790*   2821*   2852*   2883*   2938
                    3195#
INBUF   016272      3058    3086    3297#
INIFLG  015612       863     896     898*   3205#
INSTER= 104404       836#   3101
INSTR = 104403       835#    878     886     907
INSTRE  015136      3071#   3289
INSTRG  015044      3054#   3288
INSTR1  015056      3056#   3073
INSTR2  015144      3065    3074#
LAST    015616      2915*   2961    2963*   3207#   3244*
LENGTC= 000011       922#    953#    984#   1015#   1046#   1077#   1108#   1139#   1170#   1201#   1232#   1263#   1294#
                    1325#   1356#   1387#   1418#   1449#   1480#   1511#   1542#   1573#   1604#   1635#   1666#   1697#
                    1728#   1759#   1790#   1821#   1852#   1883#   1914#   1945#   1976#   2007#   2038#   2069#   2100#
                    2131#   2162#   2193#   2224#   2255#   2286#   2317#   2348#   2379#   2410#   2441#   2472#   2503#
                    2534#   2565#   2596#   2627#   2658#   2689#   2720#   2751#   2782#   2813#   2844#   2875#   2906#
LENGTX= 000004       922#    953#    984#   1015#   1046#   1077#   1108#   1139#   1170#   1201#   1232#   1263#   1294#
                    1325#   1356#   1387#   1418#   1449#   1480#   1511#   1542#   1573#   1604#   1635#   1666#   1697#
                    1728#   1759#   1790#   1821#   1852#   1883#   1914#   1945#   1976#   2007#   2038#   2069#   2100#
                    2131#   2162#   2193#   2224#   2255#   2286#   2317#   2348#   2379#   2410#   2441#   2472#   2503#
                    2534#   2565#   2596#   2627#   2658#   2689#   2720#   2751#   2782#   2813#   2844#   2875#   2906#
LIGHTS= 177570       524#   2918*
LIMITS  015256      3096    3106#
LINEX = 000020       922#    953     984    1015    1046#   1077    1108    1139    1170#   1201    1232    1263    1294#
                    1325    1356    1387    1419*   1449    1480    1511    1542#   1573    1604    1635    1666#   1697
                    1728    1759    1790#   1821    1852    1883    1914#   1945    1976    2007    2038#   2069    2100
                    2131    2162#   2193    2224    2255    2286#   2317    2348    2379    2410#   2441    2472    2503
                    2534#   2565    2596    2627    2658#   2689    2720    2751    2782#   2813    2844    2875    2906#
LOBITS  015330      3082*   3110    3124#   3125
LOGICA  014332       842    2922#
LOLIM   015322      3079*   3108    3121#
LPCNT   015570      2937*   2938    2940*   3196#
MCRLF   016130      3130    3266#
MDATA   016316      3149    3160    3301#
MEPASS  016220      2914    3276#
MPFAIL  016133      3242    3267#
MQM     016124      3072    3265#
MR      016230       920    3278#
MREGAD  016070       887    3260#
MSG     015060      3054*   3057#
MTITLE  015766       862    3249#
MTSTPC  016234       908    3279#
MVECTO  016046       879    3257#
N     = 000001         1#
OCTASC= 104402       834#   2979    2986    3239
OCTASN  015332      3129#   3287
PARAM = 104405       837#    880     888     909
PARAMS  015146      3078#   3290
PARAM1  015176      3085#   3102
PARERR  015252      3088    3090    3092    3101#   3107    3109    3111
PASCNT  015554       858*   2917*   2918    3190#
PC    =%000007       519#   2922*
PFAIL   015622       817     856    3212#   3233
PFTAB   015756      3240    3246#
```

```
POPRO = 012600           533#   2994
POP1SP= 005726           531#
POP2SP= 022626           535#
PS    = 177776           525#    854*    903*    929*    960*    991*   1022*   1053*   1084*   1115*   1146*   1177*   1208*
                        1239*   1270*   1301*   1332*   1363*   1394*   1425*   1456*   1487*   1518*   1549*   1580*   1611*
                        1642*   1673*   1704*   1735*   1766*   1797*   1828*   1859*   1890*   1921*   1952*   1983*   2014*
                        2045*   2076*   2107*   2138*   2169*   2200*   2231*   2262*   2293*   2324*   2355*   2386*   2417*
                        2448*   2479*   2510*   2541*   2572*   2603*   2634*   2665*   2696*   2727*   2758*   2789*   2820*
                        2851*   2882*   3234*
PUSHRO= 010046           532#   2991
PUSH1S= 005746           530#
PUSH2S= 024646           534#
RDATA = 107777           922#
RESREG  014614          2985    2988#
RESTAR  015660          3220    3226#
RESTRT  014342          2920    2926#
RESOS = 104407           839#   2988
RETURN  015560           916*    921    2942*   2944    3192#   3245
RSOS    014760          3032#   3292
R0    =%000000           512#   2992*   3028    3032*   3139*   3143*   3150    3212    3232*
R1    =%000001           513#    869*    872*    874*    876    2919*   2922    3027    3033*   3131*   3133    3134    3135
                        3136    3213    3231*
R2    =%000002           514#    870*    872     873*    875*   3026    3034*   3214    3230*
R3    =%000003           515#    871*    874     875    3025    3035*   3059*   3069*   3140*   3141*   3142*   3143    3149*
                        3150*   3155*   3158*   3215    3229*
R4    =%000004           516#    942*    948     973*    979    1004*   1010    1035*   1041    1066*   1072    1097*   1103
                        1128*   1134    1159*   1165    1190*   1196    1221*   1227    1252*   1258    1283*   1289    1314*
                        1320    1345*   1351    1376*   1382    1407*   1413    1438*   1444    1469*   1475    1500*   1506
                        1531*   1537    1562*   1568    1593*   1599    1624*   1630    1655*   1661    1686*   1692    1717*
                        1723    1748*   1754    1779*   1785    1810*   1816    1841*   1847    1872*   1878    1903*   1909
                        1934*   1940    1965*   1971    1996*   2002    2027*   2033    2058*   2064    2089*   2095    2120*
                        2126    2151*   2157    2182*   2188    2213*   2219    2244*   2250    2275*   2281    2306*   2312
                        2337*   2343    2368*   2374    2399*   2405    2430*   2436    2461*   2467    2492*   2498    2523*
                        2529    2554*   2560    2585*   2591    2616*   2622    2647*   2653    2678*   2684    2709*   2715
                        2740*   2746    2771*   2777    2802*   2808    2833*   2839    2864*   2870    2895*   2901    2968*
                        2969*   2970*   2971*   2972*   2973    2974    3024    3036*   3058*   3062*   3063*   3064    3086*
                        3087    3089    3091    3093*   3094    3095    3115*   3116*   3137*   3140    3144*   3145*   3146*
                        3216    3228*
R5    =%000005           517#    945*    948     976*    979    1007*   1010    1038*   1041    1069*   1072    1100*   1103
                        1131*   1134    1162*   1165    1193*   1196    1224*   1227    1255*   1258    1286*   1289    1317*
                        1320    1348*   1351    1379*   1382    1410*   1413    1441*   1444    1472*   1475    1503*   1506
                        1534*   1537    1565*   1568    1596*   1599    1627*   1630    1658*   1661    1689*   1692    1720*
                        1723    1751*   1754    1782*   1785    1813*   1816    1844*   1847    1875*   1878    1906*   1909
                        1937*   1940    1968*   1971    1999*   2002    2030*   2033    2061*   2064    2092*   2095    2123*
                        2126    2154*   2157    2185*   2188    2216*   2219    2247*   2250    2278*   2281    2309*   2312
                        2340*   2343    2371*   2374    2402*   2405    2433*   2436    2464*   2467    2495*   2498    2526*
                        2529    2557*   2560    2588*   2591    2619*   2622    2650*   2653    2681*   2684    2712*   2715
                        2743*   2746    2774*   2777    2805*   2808    2836*   2839    2867*   2870    2998*   2901    2966*
                        2967*   2968    3023    3037*   3042*   3046    3049    3078*   3079    3080    3081    3082    3083
                        3084    3085*   3094*   3097*   3098*   3099*   3106    3108    3110    3116    3117*   3138*   3147*
                        3217    3227*
SAVPC   015610          3002    3019*   3204#
SAVR0   015572          3028*   3032    3197#
SAVR1   015574          3027*   3033    3198#
SAVR2   015576          3026*   3034    3199#
SAVR3   015600          3025*   3035    3200#
```

```
SAVR4   015602           3024*   3036    3201#   3321
SAVR5   015604           3023*   3037    3202#   3319
SAVSP   015606           3203#   3219*   3226
SAVOSP= 104406            838#   2965
SCOPE = 104400            832#    952     983    1014    1045    1076    1107    1138    1169    1200    1231    1262    1293
                         1324    1355    1386    1417    1448    1479    1510    1541    1572    1603    1634    1665    1696
                         1727    1758    1789    1820    1851    1882    1913    1944    1975    2006    2037    2068    2099
                         2130    2161    2192    2223    2254    2285    2316    2347    2378    2409    2440    2471    2502
                         2533    2564    2595    2626    2657    2688    2719    2750    2781    2812    2843    2874    2905
SCOPER  014346           2931#   3285
SCOPE1= 104410            840#
SCOP1R  014446           2952#   3293
SP     =%000006           518#    855*    904*    2942    2944*   2954*   2961    2963    2966    2992    2998*   3008*   3009*
                         3010*   3011*   3012*   3013*   3014*   3015    3019    3042    3043*   3054    3055*   3078    3084*
                         3131    3132*   3212*   3213*   3214*   3215*   3216*   3217*   3218*   3219    3226*   3227    3228
                         3229    3230    3231    3232    3235*
SPACNT= 015505           3135*   3153    3156*   3166#
STACK = 016620            526#    855     904    3235
START   001000            824     854#
STFLG   015614            857*    917     919*   3206#
SVOS    014726           3023#
SVOSP   014720           3019#   3291
SWR    = 177570           523#    867     905    2931    2933    2935    2952    2959    2989    2996
SW00   = 000001            506#    867
SW01   = 000002            505#    905
SW02   = 000004            504#
SW03   = 000010            503#
SW04   = 000020            502#
SW05   = 000040            501#
SW06   = 000100            500#
SW08   = 000400            499#
SW09   = 001000            498#   2952
SW10   = 002000            497#   2931    2996
SW11   = 004000            496#   2935
SW12   = 010000            495#
SW13   = 020000            494#   2959
SW14   = 040000            493#   2933
SW15   = 100000            492#
TDATA   015620             933*    936     964*    967     995*    998    1026*   1029    1057*   1060    1088*   1091    1119*
                         1122    1150*   1153    1181*   1184    1212*   1215    1243*   1246    1274*   1277    1305*   1308
                         1336*   1339    1367*   1370    1398*   1401    1429*   1432    1460*   1463    1491*   1494    1522*
                         1525    1553*   1556    1584*   1587    1615*   1618    1646*   1649    1677*   1680    1708*   1711
                         1739*   1742    1770*   1773    1801*   1804    1832*   1835    1863*   1866    1894*   1897    1925*
                         1928    1956*   1959    1987*   1990    2018*   2021    2049*   2052    2080*   2083    2111*   2114
                         2142*   2145    2173*   2176    2204*   2207    2235*   2238    2266*   2269    2297*   2300    2328*
                         2331    2359*   2362    2390*   2393    2421*   2424    2452*   2455    2483*   2486    2514*   2517
                         2545*   2548    2576*   2579    2607*   2610    2638*   2641    2669*   2672    2700*   2703    2731*
                         2734    2762*   2765    2793*   2796    2824*   2827    2855*   2858    2886*   2889    3208#
TEMP    016304           3139    3236*   3237*   3299#
TKCSR   015510           3060    3170#
TKDBR   015512           3062    3066    3171#
TPCSR   015514           3044    3067    3172#
TPDBR   015516           3049*   3066*   3173#
TRPOK   014700           3011#
TRPSRV  014666            821    3008#
TRPTAB  016250           3013    3285#
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DZDHE   MACY11 27(732)  31-MAR-76  16:08  PAGE 75
DZDHEB.PFC      CROSS REFERENCE TABLE -- USER SYMBOLS

TYPDAT  014602           2978    2984#
TYPE  = 104401            833#    862     920    2913    2982    3056    3071    3129    3159    3241
TYPER   015012           3042#   3286
TYPMSG  014564           2976    2979#
T1      001274            916     929#
T10     002444           1146#
T100    014144           2882#
T11     002574           1177#
T12     002724           1208#
T13     003054           1239#
T14     003204           1270#
T15     003334           1301#
T16     003464           1332#
T17     003614           1363#
T2      001424            960#
T20     003744           1394#
T21     004074           1425#
T22     004224           1456#
T23     004354           1487#
T24     004504           1518#
T25     004634           1549#
T26     004764           1580#
T27     005114           1611#
T3      001554            991#
T30     005244           1642#
T31     005374           1673#
T32     005524           1704#
T33     005654           1735#
T34     006004           1766#
T35     006134           1797#
T36     006264           1828#
T37     006414           1859#
T4      001704           1022#
T40     006544           1890#
T41     006674           1921#
T42     007024           1952#
T43     007154           1983#
T44     007304           2014#
T45     007434           2045#
T46     007564           2076#
T47     007714           2107#
T5      002034           1053#
T50     010044           2138#
T51     010174           2169#
T52     010324           2200#
T53     010454           2231#
T54     010604           2262#
T55     010734           2293#
T56     011064           2324#
T57     011214           2355#
T6      002164           1084#
T60     011344           2386#
T61     011474           2417#
T62     011624           2448#
T63     011754           2479#
T64     012104           2510#
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T65     012234            2541#
T66     012364            2572#
T67     012514            2603#
T7      002314            1115#
T70     012644            2634#
T71     012774            2665#
T72     013124            2696#
T73     013254            2727#
T74     013404            2758#
T75     013534            2789#
T76     013664            2820#
T77     014014            2851#
VEC1    001060             864     867#
VEC2    001070             866     869#
WRDCNT  015502            3133*   3161*   3164#
X       = 000000             1#
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                          1325#   1356#   1387#   1418#   1449#   1480#   1511#   1542#   1573#   1604#   1635#   1666#   1697#
                          1728#   1759#   1790#   1821#   1852#   1883#   1914#   1945#   1976#   2007#   2038#   2069#   2100#
                          2131#   2162#   2193#   2224#   2255#   2286#   2317#   2348#   2379#   2410#   2441#   2472#   2503#
                          2534#   2565#   2596#   2627#   2658#   2689#   2720#   2751#   2782#   2813#   2844#   2875#   2906#
XLENGT= 000004            922#
XLINE   = 000020          922#
XN      = 000101             1#    929     932#    960     963#    991     994#   1022    1025#   1053    1056#   1084    1087#
                         1115    1118#   1146    1149#   1177    1180#   1208    1211#   1239    1242#   1270    1273#   1301
                         1304#   1332    1335#   1363    1366#   1394    1397#   1425    1428#   1456    1459#   1487    1490#
                         1518    1521#   1549    1552#   1580    1583#   1611    1614#   1642    1645#   1673    1676#   1704
                         1707#   1735    1738#   1766    1769#   1797    1800#   1828    1831#   1859    1862#   1890    1893#
                         1921    1924#   1952    1955#   1983    1986#   2014    2017#   2045    2048#   2076    2079#   2107
                         2110#   2138    2141#   2169    2172#   2200    2203#   2231    2234#   2262    2265#   2293    2296#
                         2324    2327#   2355    2358#   2386    2389#   2417    2420#   2448    2451#   2479    2482#   2510
                         2513#   2541    2544#   2572    2575#   2603    2606#   2634    2637#   2665    2668#   2696    2699#
                         2727    2730#   2758    2761#   2789    2792#   2820    2823#   2851    2854#   2882    2885#
Y       = 000011             1#    832     833#    834#    835#    836#    837#    838#    939#    840#    841#
.       = 016422           556#    557     559     561     563     565     567     569     571     573     575     577     579
                           581     583     585     587     589     591     593     595     597     599     601     603     605
                           607     609     611     613     615     617     619     621     623     625     627     629     631
                           633     635     637     639     641     643     645     647     649     651     653     655     657
                           659     661     663     665     667     669     671     673     675     677     679     681     683
                           685     687     689     691     693     695     697     699     701     703     705     707     709
                           711     713     715     717     719     721     723     725     727     729     731     733     735
                           737     739     741     743     745     747     749     751     753     755     757     759     761
                           763     765     767     769     771     773     775     777     779     781     783     785     787
                           789     791     793     795     797     799     801     803     805     807     809     811     816#
                           823#    841#    843#    845#   3222    3238    3281#   3298#   3300#   3302#   3316#
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CHART1   922#   953   984  1015  1046  1077  1108  1139  1170  1201  1232  1263  1294  1325  1356
        1387  1418  1449  1480  1511  1542  1573  1604  1635  1666  1697  1728  1759  1790  1821
        1852  1883  1914  1945  1976  2007  2038  2069  2100  2131  2162  2193  2224  2255  2286
        2317  2348  2379  2410  2441  2472  2503  2534  2565  2596  2627  2658  2689  2720  2751
        2782  2813  2844  2875
CODEM1   845#   894
HLT      536#   950   981  1012  1043  1074  1105  1136  1167  1198  1229  1260  1291  1322  1353
        1384  1415  1446  1477  1508  1539  1570  1601  1632  1663  1694  1725  1756  1787  1818
        1849  1880  1911  1942  1973  2004  2035  2066  2097  2128  2159  2190  2221  2252  2283
        2314  2345  2376  2407  2438  2469  2500  2531  2562  2593  2624  2655  2686  2717  2748
        2779  2810  2841  2872  2903
TRPDEF     1#   832   833   834   835   836   837   838   839   840
TS         1#   929   960   991  1022  1053  1084  1115  1146  1177  1208  1239  1270  1301  1332
        1363  1394  1425  1456  1487  1518  1549  1580  1611  1642  1673  1704  1735  1766  1797
        1828  1859  1890  1921  1952  1983  2014  2045  2076  2107  2138  2169  2200  2231  2262
        2293  2324  2355  2386  2417  2448  2479  2510  2541  2572  2603  2634  2665  2696  2727
        2758  2789  2820  2851  2882
.BUFFE     1#  3294
.CATCH     1#   555
.ENDCO     1#  3322
.EOP       1#  2906
.ERROR     1#  2956
.ERRTA     1#  3303
.HEADE     1#   470
.INSTR     1#  3051
.MSG       1#  3249
.OCTAS     1#  3126
.PARAM     1#  3075
.PFAIL     1#  3209
.POINT     1#  3168
.RESRE     1#  3030
.SAVRE     1#  3016
.SCOPE     1#  2927
.SCOP1     1#  2949
.SETVE     1#   813
.START     1#   845
.SYMBO     1#   489
.TRPDE     1#   827
.TRPSR     1#  3003
.TRPTA     1#  3282
.TYPER     1#  3039
.VARIA     1#  3187
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DZDHEB.PFC CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

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ADD      874   875  2972  3013  3043  3055  3117  3132  3142
ASL     2969  2970  3011  3097  3098  3099
ASR     3144  3145  3146
BEQ      868   906   949   980  1011  1042  1073  1104  1135  1166  1197  1228  1259  1290  1321
        1352  1383  1414  1445  1476  1507  1538  1569  1600  1631  1662  1693  1724  1755  1786
        1817  1848  1879  1910  1941  1972  2003  2034  2065  2096  2127  2158  2189  2220  2251
        2282  2313  2344  2375  2406  2437  2468  2499  2530  2561  2592  2623  2654  2685  2716
        2747  2778  2809  2840  2871  2902  2920  2947  2953  2962  2976  2985  2997  3065  3088
        3096  3154
BGT     3092
BHI     3107
BIC     2971  3012  3141
BICB    3063  3093
BIS      938   969  1000  1031  1062  1093  1124  1155  1186  1217  1248  1279  1310  1341  1372
        1403  1434  1465  1496  1527  1558  1589  1620  1651  1682  1713  1744  1775  1806  1837
        1868  1899  1930  1961  1992  2023  2054  2085  2116  2147  2178  2209  2240  2271  2302
        2333  2364  2395  2426  2457  2488  2519  2550  2581  2612  2643  2674  2705  2736  2767
        2798  2829  2860  2891
BISB    3094
BIT      867   905  2931  2933  2935  2952  2959  2996
BITB    3110
BLO     3109
BLT     3090
BNE      864   877   897   918  2932  2934  2936  2939  2960  2978  3047  3070  3111  3119  3148
        3152  3157  3162  3238
BPL      941   972  1003  1034  1065  1096  1127  1158  1189  1220  1251  1282  1313  1344  1375
        1406  1437  1468  1499  1530  1561  1592  1623  1654  1685  1716  1747  1778  1809  1840
        1871  1902  1933  1964  1995  2026  2057  2088  2119  2150  2181  2212  2243  2274  2305
        2336  2367  2398  2429  2460  2491  2522  2553  2584  2615  2646  2677  2708  2739  2770
        2801  2832  2863  2894  2990  3045  3061  3068
BR       866   915  2948  3050  3073  3100  3102  3222
CLR      857   858   859   860   861   873  2915  2916  2940  2941  2964  3085  3236  3243  3244
CLRB    3158
CMP      876   948   979  1010  1041  1072  1103  1134  1165  1196  1227  1258  1289  1320  1351
        1382  1413  1444  1475  1506  1537  1568  1599  1630  1661  1692  1723  1754  1785  1816
        1847  1878  1909  1940  1971  2002  2033  2064  2095  2126  2157  2188  2219  2250  2281
        2312  2343  2374  2405  2436  2467  2498  2529  2560  2591  2622  2653  2684  2715  2746
        2777  2808  2839  2870  2901  2938  2961  3106  3108
CMPB    3064  3087  3089  3091  3095
COM      898   919
DEC     3069  3147  3161
DECB    3118  3151  3156
EMT      536
HALT     558   560   562   564   566   568   570   572   574   576   578   580   582   584   586
        588   590   592   594   596   598   600   602   604   606   608   610   612   614   616
        618   620   622   624   626   628   630   632   634   636   638   640   642   644   646
        648   650   652   654   656   658   660   662   664   666   668   670   672   674   676
        678   680   682   684   686   688   690   692   694   696   698   700   702   704   706
        708   710   712   714   716   718   720   722   724   726   728   730   732   734   736
        738   740   742   744   746   748   750   752   754   756   758   760   762   764   766
        768   770   772   774   776   778   780   782   784   786   788   790   792   794   796
        798   800   802   804   806   808   810   812  2993  3221
INC      895  2917  2937  2995  3237
JMP      824   921  2926  3015  3245
JSR     2922
MOV      854   855   856   869   870   871   872   894   903   904   916   929   930   931   932
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933	934	935	936	937	939	942	945	960	961	962	963	964	965	966
967	968	970	973	976	991	992	993	994	995	996	997	998	999	1001
1004	1007	1022	1023	1024	1025	1026	1027	1028	1029	1030	1032	1035	1038	1053
1054	1055	1056	1057	1058	1059	1060	1061	1063	1066	1069	1084	1085	1086	1087
1088	1089	1090	1091	1092	1094	1097	1100	1115	1116	1117	1118	1119	1120	1121
1122	1123	1125	1128	1131	1146	1147	1148	1149	1150	1151	1152	1153	1154	1156
1159	1162	1177	1178	1179	1180	1181	1182	1183	1184	1185	1187	1190	1193	1208
1209	1210	1211	1212	1213	1214	1215	1216	1218	1221	1224	1239	1240	1241	1242
1243	1244	1245	1246	1247	1249	1252	1255	1270	1271	1272	1273	1274	1275	1276
1277	1278	1280	1283	1286	1301	1302	1303	1304	1305	1306	1307	1308	1309	1311
1314	1317	1332	1333	1334	1335	1336	1337	1338	1339	1340	1342	1345	1348	1363
1364	1365	1366	1367	1368	1369	1370	1371	1373	1376	1379	1394	1395	1396	1397
1398	1399	1400	1401	1402	1404	1407	1410	1425	1426	1427	1428	1429	1430	1431
1432	1433	1435	1438	1441	1456	1457	1458	1459	1460	1461	1462	1463	1464	1466
1469	1472	1487	1488	1489	1490	1491	1492	1493	1494	1495	1497	1500	1503	1518
1519	1520	1521	1522	1523	1524	1525	1526	1528	1531	1534	1549	1550	1551	1552
1553	1554	1555	1556	1557	1559	1562	1565	1580	1581	1582	1583	1584	1585	1586
1587	1588	1590	1593	1596	1611	1612	1613	1614	1615	1616	1617	1618	1619	1621
1624	1627	1642	1643	1644	1645	1646	1647	1648	1649	1650	1652	1655	1658	1673
1674	1675	1676	1677	1678	1679	1680	1681	1683	1686	1689	1704	1705	1706	1707
1708	1709	1710	1711	1712	1714	1717	1720	1735	1736	1737	1738	1739	1740	1741
1742	1743	1745	1748	1751	1766	1767	1768	1769	1770	1771	1772	1773	1774	1776
1779	1782	1797	1798	1799	1800	1801	1802	1803	1804	1805	1807	1810	1813	1828
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1863	1864	1865	1866	1867	1869	1872	1875	1890	1891	1892	1893	1894	1895	1896
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1934	1937	1952	1953	1954	1955	1956	1957	1958	1959	1960	1962	1965	1968	1983
1984	1985	1986	1987	1988	1989	1990	1991	1993	1996	1999	2014	2015	2016	2017
2018	2019	2020	2021	2022	2024	2027	2030	2045	2046	2047	2048	2049	2050	2051
2052	2053	2055	2058	2061	2076	2077	2078	2079	2080	2081	2082	2083	2084	2086
2089	2092	2107	2108	2109	2110	2111	2112	2113	2114	2115	2117	2120	2123	2138
2139	2140	2141	2142	2143	2144	2145	2146	2148	2151	2154	2169	2170	2171	2172
2173	2174	2175	2176	2177	2179	2182	2185	2200	2201	2202	2203	2204	2205	2206
2207	2208	2210	2213	2216	2231	2232	2233	2234	2235	2236	2237	2238	2239	2241
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2328	2329	2330	2331	2332	2334	2337	2340	2355	2356	2357	2358	2359	2360	2361
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2399	2402	2417	2418	2419	2420	2421	2422	2423	2424	2425	2427	2430	2433	2448
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2483	2484	2485	2486	2487	2489	2492	2495	2510	2511	2512	2513	2514	2515	2516
2517	2518	2520	2523	2526	2541	2542	2543	2544	2545	2546	2547	2548	2549	2551
2554	2557	2572	2573	2574	2575	2576	2577	2578	2579	2580	2582	2585	2588	2603
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2638	2639	2640	2641	2642	2644	2647	2650	2665	2666	2667	2668	2669	2670	2671
2672	2673	2675	2678	2681	2696	2697	2698	2699	2700	2701	2702	2703	2704	2706
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2759	2760	2761	2762	2763	2764	2765	2766	2768	2771	2774	2789	2790	2791	2792
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3058	3059	3078	3079	3080	3081	3084	3086	3115	3116	3131	3133	3136	3137	3139
3140	3149	3212	3213	3214	3215	3216	3217	3218	3219	3220	3226	3227	3228	3229
3230	3231	3232	3233	3234	3235									

DZDHEB.PFC CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

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MOVB     3049    3062    3066    3082    3083    3134    3135    3138    3143    3150    3155
NOP      2923    2924    2925
RESET    2921
RETURN    912    3248
RTI      2943    2945    2955    2999    3029    3038    3048    3074    3120    3163
SUB      2967    3009
TRAP      832     833     834     835     836     837     838     839     840
TST       863     896     917    2946    2975    2977    2984    2989
TSTB      940     971    1002    1033    1064    1095    1126    1157    1188    1219    1250    1281    1312    1343    1374
         1405    1436    1467    1498    1529    1560    1591    1622    1653    1684    1715    1746    1777    1808    1839
         1870    1901    1932    1963    1994    2025    2056    2087    2118    2149    2180    2211    2242    2273    2304
         2335    2366    2397    2428    2459    2490    2521    2552    2583    2614    2645    2676    2707    2738    2769
         2800    2831    2862    2893    3044    3046    3060    3067    3153
.ASCIZ   3249    3257    3260    3265    3266    3267    3276    3278    3279    3309
.BYTE     884     885     892     893     913     914    3001    3318    3320
.ENABL    489
.END     3323
.ENDC     866     867     894     896     932     963     994    1025    1056    1087    1118    1149    1180    1211    1242
         1273    1304    1335    1366    1397    1428    1459    1490    1521    1552    1583    1614    1645    1676    1707
         1738    1769    1800    1831    1862    1893    1924    1955    1986    2017    2048    2079    2110    2141    2172
         2203    2234    2265    2296    2327    2358    2389    2420    2451    2482    2513    2544    2575    2606    2637
         2668    2699    2730    2761    2792    2823    2854    2885
.EQUIV    536
.EVEN    3281    3316
.IF       864     866     894     932     963     994    1025    1056    1087    1118    1149    1180    1211    1242    1273
         1304    1335    1366    1397    1428    1459    1490    1521    1552    1583    1614    1645    1676    1707    1738
         1769    1800    1831    1862    1893    1924    1955    1986    2017    2048    2079    2110    2141    2172    2203
         2234    2265    2296    2327    2358    2389    2420    2451    2482    2513    2544    2575    2606    2637    2668
         2699    2730    2761    2792    2823    2854    2885
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.IIF      853
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         2131    2141    2162    2172    2193    2203    2224    2234    2255    2265    2286    2296    2317    2327    2348
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DZDHE   MACY11 27(732)  31-MAR-76  16:08  PAGE 83
DZDHEB.PFC      CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

          2659    2782
.TITLE     489


 ERRORS DETECTED:  0
 DEFAULT GLOBALS GENERATED:  0

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 RUN-TIME RATIO: 310/49=6.3
 CORE USED:  11K  (21 PAGES)
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Spooler runtime 13 Seconds, 398 KCS, 352 disk reads, 3 disk writes, 79 pages