LA36

TERMINAL (DH11 & DJ11)

MD-11-DZLAD-C

EP-DZLAD-C-DL-A

OCT 1976

digital

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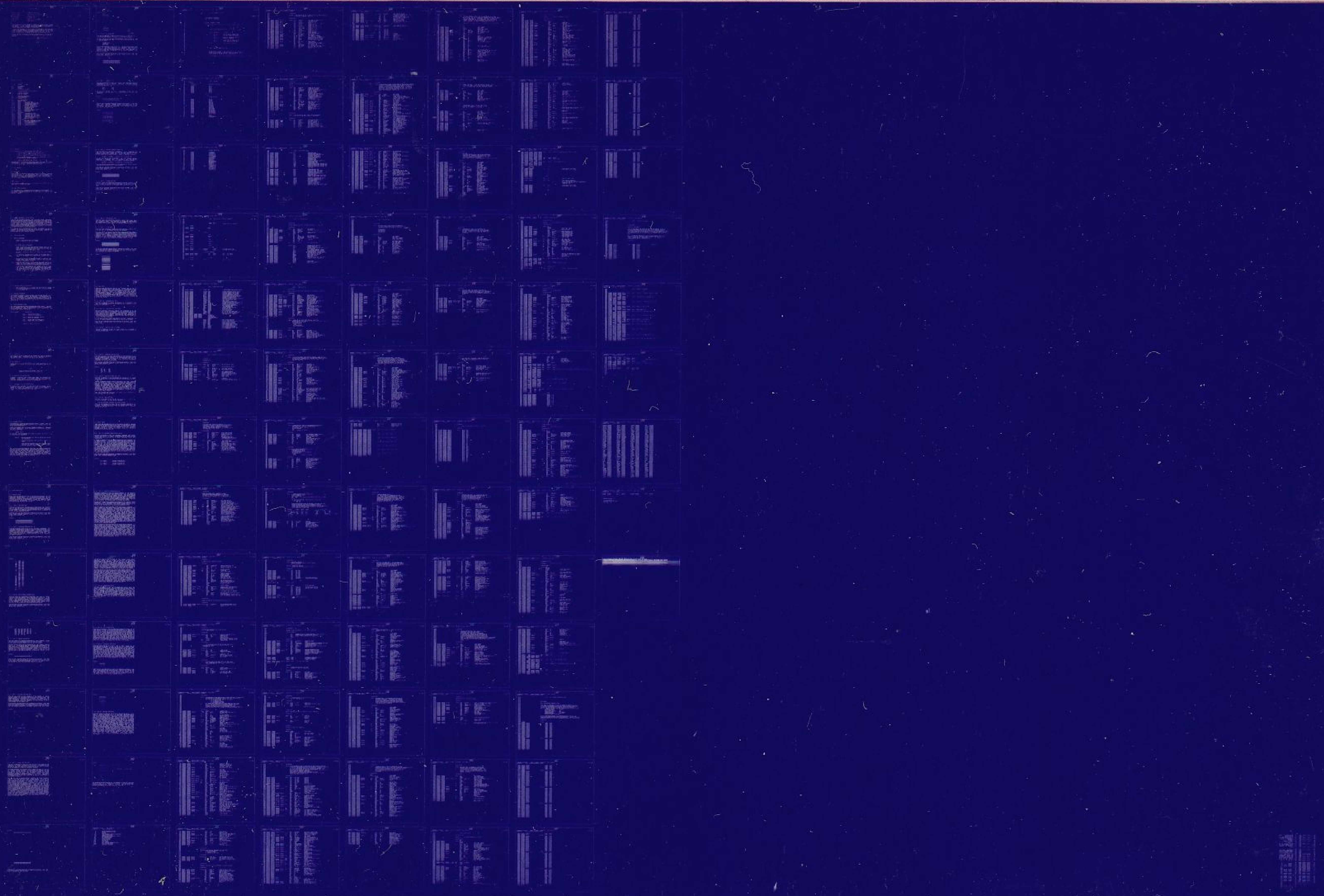
Made In U.S.A.



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                    IDENTIFICATION

PRODUCT CODE:           MAINDEC-11-DZLAD-C-D

PRODUCT NAME:           LA36 TERMINAL (DH11 & DJ11 INTERFACE)

DATE CREATED:           SEPTEMBER 1975

MAINTAINER:             DIAGNOSTIC GROUP

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1.0 ABSTRACT

THIS DIAGNOSTIC IS DIVIDED INTO FOUR BASIC SECTIONS:

1. A CHECK OF THE CONSOLE TERMINAL INTERFACE LOGIC
2. A CHECK OF THE PRINTING CHARACTERISTICS AND CONTROL LOGIC
3. AN ECHO PORTION DESIGNED TO CHECK THE KEYBOARD AND TO AID IN THE DIAGNOSIS OF TERMINAL PROBLEMS.
4. A CHECK OF THE VARIOUS LA36 OPTIONS.

PATTERNS USED BY THE PRINTING TESTS WERE CHOSEN FOR EASE OF VISUAL VERIFICATION. THE ECHO TESTS WERE DESIGNED FOR MAXIMUM FLEXIBILITY, WITH TEST 24 ALLOWING ANY DESIRED PATTERN TO BE USED.

2.0 REQUIREMENTS

2.1 EQUIPMENT

THE DIAGNOSTIC IS WRITTEN TO RUN ON ALL MODELS OF THE PDP-11 COMPUTER WITH EITHER DH11 OR DJ11 MULTIPLEXER. UP TO 16 MULTIPLEXERS + 256 TERMINALS ARE DRIVEN. THE DIAGNOSTIC IS SET TO TEST THE TERMINALS AT 300 BAUD. TO CHANGE ANY PARAMETERS FOR THE DH11 INTERFACE REFER TO THE DH11 PARAMETER TABLE IN THE LISTING.

2.2 STORAGE

THE DIAGNOSTIC PROGRAM USES ALL OF 4K OF MEMORY WITH EXCEPTION OF THE AREA USED BY THE ABSOLUTE LOADER.

2.3 PRELIMINARY PROGRAMS

ANY APPLICABLE PDP-11 DIAGNOSTICS SHOULD BE RUN ON THE PROCESSOR. IF ANY ERRORS ARE ENCOUNTERED DURING THE INTERFACE CHECK, REFER TO THE APPROPRIATE INTERFACE DIAGNOSTIC FOR FURTHER HELP IN LOCATING THE PROBLEM IF NEEDED.

3.0 LOADING PROCEDURE & INITIALIZATION

LOAD THE LA36 DIAGNOSTIC PROGRAM TAPE FOLLOWING NORMAL PROCEDURES. BEFORE STARTING THE PROGRAM, REFER TO THE EXISTING LINE TABLE (ELTAB) AND CLEAR THE PROPER BITS IN THE TABLE TO INDICATE WHICH TERMINALS ARE TO BE TESTED. A DETAILED DESCRIPTION IS CONTAINED IN THE PROGRAM LISTING. ALSO, REFER TO THE DESCRIPTION OF THE ROUTINE "DLY". TIME DELAYS USED BY THE PROGRAM ARE A FUNCTION OF THE CPU MODEL AND MEMORY TYPE AND SHOULD BE SET UP BEFORE RUNNING THE DIAGNOSTIC. THE ROUTINE IS PRESET FOR A PDP-11/40 WITH CORE MEMORY.

IF A HARDWARE SWITCH REGISTER DOES NOT EXIST, THE PROGRAM WILL USE THE CONTENTS OF LOCATION 176 AS THE VALUE OF THE SWITCHES. THEREFORE, BE SURE TO LOAD LOCATION 176 WITH THE SWITCH VALUE BEFORE STARTING THE PROGRAM WHEN NOT USING HARDWARE SWITCHES.

4.0 STARTING PROCEDURE

4.1 STARTING ADDRESSES

200(8) = EXECUTE WITH DH11 MULTIPLEXER
204(8) = EXECUTE WITH DJ11 MULTIPLEXER

4.1.1 EXECUTE WITH DH11 MULTIPLEXER

A. REFER TO SECTION 3.0 AND MAKE SURE THE PROPER BITS IN THE ELTAB TABLE INDICATING WHAT TERMINALS ARE TO BE TESTED HAVE BEEN CLEARED AND THE CORRECT DELAY COUNT FOR THE CPU AND MEMORY TYPE IN USE HAS BEEN SET IN TIMER.

B. SET SWITCH REGISTER = 200(8) AND PRESS THE LOAD ADDRESS SWITCH

C. SET THE SWITCH REGISTER BITS 7-0 EQUAL TO THE PAPER WIDTH IN TERMS OF THE NUMBER OF COLUMNS (OCTAL). REFER TO SECTION 5.1.4

D. SET SWITCH 8 UP IF IT IS DESIRED TO SELECT A SPECIFIC TEST RATHER THAN BEGIN THE NORMAL PRINTING TEST SEQUENCE. OTHERWISE, LEAVE SWITCH 8 DOWN.

E. PRESS THE START SWITCH. IF BIT 8 WERE ZERO WHEN STARTING THE NUMBER OF DH11'S UNDER TEST WILL BE PRINTED ON ALL EXISTING TERMINALS AND THE PRINTER TESTS ARE EXECUTED SEQUENTIALLY.

F. IF BIT 8 WERE 1 WHEN STARTING, THE NUMBER OF DH11'S UNDER TEST WILL BE INDICATED AND THE MESSAGE "SELECT TEST NUMBER" WILL BE PRINTED ON ALL EXISTING TERMINALS. THE PROGRAM WILL THEN BE WAITING FOR A TEST SELECTION VIA ANY TERMINAL KEYBOARD (IF SWITCH 13 IS DOWN). REFER TO SECTION 5.2

4.1.2 EXECUTE WITH DJ11 MULTIPLEXER

A. SAME INSTRUCTIONS AS 4.1.1 EXCEPT THAT THE STARTING ADDRESS IN 3 IS 204 AND THE FIRST MESSAGE PRINTED WILL BE THE NUMBER OF DJ11'S UNDER TEST.

5.0 OPERATING PROCEDURE

THE PROGRAM IS GENERALLY CONTROLLED FROM A MULTIPLEXER TERMINAL, BUT A FEW SWITCH REGISTER CONTROLS ARE AVAILABLE. THE PRINTER TEST WILL OUTPUT TO ALL TERMINALS OR TO THE ONE UNDER TEST AS A FUNCTION OF SR BIT 13. ECHO TESTS WILL REFERENCE ONLY THE TERMINAL SELECTING THE TESTI, OR ALL TERMINALS DEPENDING ON THE SPECIFIC TEST AND THE SETTING OF SWITCH 13.

5.1 SWITCH REGISTER CONTROL

THE VARIOUS SWITCHES AND THEIR FUNCTIONS ARE LISTED BELOW. SWITCHES MAY BE CHANGED AND SET AS DESIRED EXCEPT AS NOTED IN THE SPECIFIC SWITCH DESCRIPTIONS. REFER TO THE DETAILED SWITCH DESCRIPTIONS FOR FURTHER, MORE COMPLETE INFORMATION.

SWITCH NUMBER	DESCRIPTION
15	1(UP) = HALT AT END OF TEST 0(DOWN) = CONTINUE TEST SEQUENCE
13	1(UP) = DRIVE ONLY SELECTED TERMINAL 0(DOWN) = DRIVE ALL TERMINALS
8	1(UP) = SELECT TEST (AT START-UP ONLY) 0(DOWN) = START NORMAL TEST SEQUENCE
7-0	NUMBER OF COLUMNS AT START-UP

5.1.1 SWITCH 15

WITH SWITCH 15 IN THE UP POSITION, THE PROGRAM WILL HALT AT THE END OF THE CURRENT TEST. REPLACING SWITCH 15 TO THE DOWN POSITION AND PRESSING CONTINUE WILL CONTINUE THE NORMAL TEST OPERATION.

5.1.2 SWITCH 13

PLACING SWITCH 13 IN THE DOWN POSITION WILL CAUSE THE DRIVING OF ALL TERMINALS. IF SWITCH 13 IS UP, ONLY THE TERMINAL UNDER TEST IS DRIVEN.

NOTE

SWITCH 13 CAN ONLY BE CHANGED WHEN THE PROGRAM IS WAITING FOR A TEST SELECTION.

5.1.3 SWITCH 8 (AT START-UP ONLY)

TO SELECT A SPECIFIC TEST RATHER THAN START THE PRINTING TEST SEQUENCE, PLACE SWITCH 8 UP BEFORE STARTING THE DIAGNOSTIC. OTHERWISE, LEAVE SWITCH 8 DOWN TO RUN THE NORMAL TEST SEQUENCE. THIS SWITCH IS ONLY EFFECTIVE AT START-UP OF THE PROGRAM.

5.1.4 SWITCHES 7 TO 0 (AT START-UP ONLY)

AT START-UP ONLY, SWITCHES 7 TO 0 ARE USED TO SET THE DESIRED MAXIMUM NUMBER OF COLUMNS THE DIAGNOSTIC IS TO TEST. IF THE NUMBER SET IS GREATER THAN 132(10) OR LESS THAN 30(10), THE PROGRAM WILL DEFAULT TO 132(10). THE VALUE SET MUST BE IN OCTAL FORM.

5.2 KEYBOARD CONTROL

THE PROGRAM WILL ALWAYS BE UNDER KEYBOARD CONTROL. CONTROL FROM THE SWITCH REGISTER DURING PROGRAM EXECUTION IS ONLY POSSIBLE WITH SWITCHS 13 AND 15 AS STATED ABOVE.

TYPING THE "RUBOUT" (DEL) KEY ON ANY TERMINAL KEYBOARD WILL TERMINATE THE TEST IMMEDIATELY. AFTER TERMINATION OF THE TEST THE FOLLOWING MESSAGE WILL BE TYPED:

```
        SELECT TEST #
```

AT THIS TIME, TYPE THE DESIRED TEST NUMBER FOLLOWED BY ANY ONE OF THE FOLLOWING CONTROL CHARACTERS:

```
    . (PERIOD)    = RUN THE SELECTED TEST ONCE AND RETURN FOR ANOTHER
                    TEST SELECTION.

    L             = LOOP ON THE SELECTED TEST UNTIL A "RUBOUT" IS
                    TYPED.

    S             = START THE TEST SEQUENCE WITH THE SELECTED TEST.
                    CONTINUE TO LOOP ON THE PRINTING TEST SEQUENCE
                    UNTIL A "RUBOUT" IS TYPED.
```

THE L OR S MAY BE EITHER UPPER OF LOWER CASE, BUT THE TEST NUMBER MUST ALWAYS BE A 2 DIGIT OCTAL NUMBER. FOR ALL ECHO TESTS, THE "L" AND "S" WILL ONLY RUN THE TEST ONCE (THE SAME AS IF TYPING A PERIOD). FOR ALL OPTION TESTS, THE "S" WILL ONLY RUN THE TEST ONCE (THE SAME AS IF TYPING A PERIOD), HOWEVER, TYPING AN "L" WILL CAUSE THE PROGRAM TO LOOP ON THE SELECTED TEST. IF AN ERROR IS DETECTED IN THE TEST SELECTION (ILLEGAL TEST NUMBER OR CONTROL CHARACTER) A QUESTION MARK IS PRINTED AND THE MESSAGE WILL BE REPEATED.

6.0 TEST DESCRIPTIONS

6.1 PRINTING TESTS

THESE TESTS ARE DESIGNED AS A TEST OF THE PRINTING MECHANISM AND THE ASSOCIATED CONTROL LOGIC. AT THE BEGINNING OF EACH TEST, THE TEST NUMBER WILL BE PRINTED INDICATING WHICH TEST IS BEING EXECUTED AND, IF THE TEST IS A FUNCTION OF THE NUMBER OF COLUMNS, THE NUMBER OF COLUMNS BEING TESTED WILL BE INDICATED. A DETAILED DESCRIPTION AND SAMPLE PATTERNS FOR EACH PRINTING TEST FOLLOWS:

6.1.1 TEST 0 - DATA PATH TEST

THIS TEST IS USED TO TEST THE DATA LINES TO AND THROUGH THE INTERFACE AND TO THE TERMINAL. AN ALTERNATING BIT PATTERN IS SENT WHICH WILL PRINT ALTERNATING *'S AND U'S IN A CHECKERBOARD PATTERN TO THE MAXIMUM COLUMN WIDTH. THE STARTING CHARACTER FOR EACH LINE IS ALTERNATED AND A TOTAL OF FOUR LINES ARE PRINTED.

WITH THE AUTO LINE FEED OPTION SET TO PRODUCE AN AUTOMATIC LINE FEED AFTER EVERY RECEIVED CARRIAGE RETURN, THERE WILL BE A BLANK LINE BETWEEN EACH PRINTED LINE.

EXAMPLE:

```
          *U*U*U*U*U*U*U*U*U*U*U*U*U*U*U
          U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*
          *U*U*U*U*U*U*U*U*U*U*U*U*U*U*U
          U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*
```

6.1.2 TEST 1 - PRINTABLE CHARACTER TEST

THIS TEST PRODUCES A CHECK OF ALL 94(10) PRINTABLE CHARACTERS. THE CHARACTERS ARE PRINTED IN GROUPS OF THREE WITH THREE GROUPS PER LINE, SEPARATED BY THREE SPACES BETWEEN GROUPS. THE FIRST COLUMN WILL CONTAIN ALL ASCII CODES FROM 040 TO 077. COLUMN TWO WILL CONTAIN ALL ASCII CODES FROM 100 TO 137 - PRIMARILY THE CAPITAL LETTER SET. THE LAST COLUMN WILL CONTAIN ALL ASCII CODES FROM 140 TO 176 - PRIMARILY THE SMALL LETTER SET.

WITH THE AUTO LINE FEED OPTION SET TO PRODUCE AN AUTOMATIC LINE FEED AFTER EVERY RECEIVED CARRIAGE RETURN, THERE WILL BE A BLANK LINE BETWEEN EACH PRINTED LINE.

EXAMPLE:

```
                   @@@   ```
         !!!       AAA   AAA
         """       BBB   BBB
         ###       CCC   CCC
         $$$       DDD   DDD
         %%%       EEE   EEE
         &&&       FFF   FFF
         '''       GGG   GGG
         (((       HHH   HHH
         )))       III   III
         ***       JJJ   JJJ
         +++       KKK   KKK
         ,,,       LLL   LLL
         ---       MMM   MMM
         ...       NNN   NNN
         ///       OOO   OOO
         000       PPP   PPP
         111       QQQ   QQQ
         222       RRR   RRR
         333       SSS   SSS
         444       TTT   TTT
         555       UUU   UUU
         666       VVV   VVV
         777       WWW   WWW
         888       XXX   XXX
         999       YYY   YYY
         :::       ZZZ   ZZZ
         ;;;       [[[
         <<<       \\\
         ===       ]]]
         >>>
         ???
```

6.1.3 TEST 2 - NON-PRINTABLE CHARACTER TEST

THIS TEST CHECKS ALL NON-PRINTABLE CHARACTERS THAT HAVE NO CONTROL FUNCTION IN THE LA36 TERMINAL OR THE LA36 OPTIONS (SUCH AS CR, LF, BS, & BEL). FIRST THE ASCII CODE WILL BE PRINTED FOLLOWED BY THE MNEMONIC AFTER A FEW SEPARATING SPACES. FOLLOWING THE MNEMONIC, THE ACTUAL CONTROL CHARACTER WILL BE SENT THREE TIMES AND NOTHING SHOULD HAPPEN AT THE PRINTER. THIS PATTERN IS REPEATED, THREE TIMES ON A LINE, UNTIL ALL OF THE NON-PRINTING CHARACTERS HAVE BEEN TESTED.

WITH THE AUTO LINE FEED OPTION SET TO PRODUCE AN AUTOMATIC LINE FEED AFTER EVERY RECEIVED CARRIAGE RETURN, THERE WILL BE A BLANK LINE BETWEEN EACH PRINTED LINE.

EXAMPLE:

```
        000   NUL  001  SOH  002  STX
        006   ACK  020  DLE  021  DC1
        022   DC2  023  DC3  024  DC4
        025   NAK  026  SYN  027  ETB
        030   CAN  031  EM   032  SUB
        034   FS   035  GS   036  RS
        037   US   177  DEL
```

6.1.4 TEST 3 - CARRIAGE RETURN TEST

THIS TEST CHECKS THE CARRIAGE RETURN FROM ALL EVEN NUMBERED COLUMNS AND THE SPACING OF THE SOLENOID HEAD FROM THE LEFT MARGIN. IT IS ALSO A GOOD CHECK FOR PROPER OPERATION OF THE POSITION DECODER.

THE TEST PRINTS A FULL LINE OF ALTERNATING 0'S AND SPACES, STARTING WITH A 0. AT THE END OF THE LINE THE PRINT HEAD IS RETURNED TO THE LEFT MARGIN WITH A CARRIAGE RETURN. THE SPACES ARE THEN FILLED IN BY SPACING THE PRINT HEAD OUT FROM THE LEFT MARGIN TO THE FIRST SPACE, PRINTING AN "X", AND EXECUTING A CARRIAGE RETURN. THIS PATTERN IS REPEATED UNTIL THE LINE IS COMPLETED. CHECK TO SEE THAT ALL X'S ARE IN THE MIDDLE OF THE SPACE BETWEEN THE TWO ZEROES ON EITHER SIDE OF IT.

EXAMPLE:

```
        0X0X0X0X0X0X0X0X0X0X0X0X0X0X
```

WITH THE AUTO LINE FEED OPTION SET TO PRODUCE AN AUTOMATIC LINE FEED AFTER EVERY RECEIVED CARRIAGE RETURN, THIS TEST WILL PRINT A LINE OF 0'S AND SPACES, THEN PRINT A DIAGINAL LINE OF X'S. TO CORRECTLY CHECK THE ENCODER, THE AUTO LINE FEED OPTION SHOULD BE DISABLED.

EXAMPLE:

```
        0 0 0 0 0 0 0 0 0
         X
           X
             X
               X
                 X
                   X
                     X
                       X
```

6.1.5 TEST 4 - MULTIPLE LINE FEED TEST

THIS TEST CHECKS THE LINE FEED CAPABILITY OF THE PRINTER BY SENDING VARIOUS GROUPS OF LINE FEEDS INTERSPACED WITH REFERENCE LINES. THE NUMBER PRINTED AS THE REFERENCE LINE INDICATES THE NUMBER OF LINE FEEDS THAT FOLLOW. THE FIRST AND LAST LINES ALSO CONTAIN A STRING OF DASHES AS REFERENCE POINTS FOR MEASURING, THE TOTAL DISTANCE IS 63(10) LINES BETWEEN THE TWO DASHED LINES.

WITH THE AUTO LINE FEED OPTION SET TO PRODUCE AN AUTOMATIC LINE FEED AFTER EVERY CARRIAGE RETURN, THE NUMBER PRINTED WILL INDICATE ONE LESS THAN THE NUMBER OF LINE FEEDS (THE NUMBER OF BLANK LINES) THAT FOLLOW. THE TOTAL DISTANCE BETWEEN THE TWO DASHED LINES WILL THEN BE 69 LINES.

EXAMPLE:

```
          01--------------------------------------------------
          02

          04



          08







          16
             \
              15 BLANK LINES
             /
          32
             \
              31 BLANK LINES
             /
          00--------------------------------------------------
```

6.1.6 TEST 5 - SINGLE LINE FEED TEST

THIS TEST IS DESIGNED TO CHECK THE TIMING OF SINGLE LINE FEEDS AND THE CAPABILITY OF DOING LINE FEEDS IN ALL COLUMNS. TWO REFERENCE LINES ARE USED BY THIS TEST (AND TEST 6) WHICH ALSO CAN BE USED TO EASILY CHECK THE NUMBER OF COLUMNS THE PRINTER IS PRINTING.

THE FIRST REFERENCE LINE CONTAINS 130(10) ZEROES FOLLOWED BY TWO 2'S IF TESTING 132(10) COLUMNS. IF LESS THAN 132 COLUMNS, THE LINE WILL CONTAIN 0'S FOR TWO LESS THAN THE MAXIMUM NUMBER OF COLUMNS FOLLOWED BY THE TWO 2'S. THIS REFERENCE LINE IS A QUICK CHECK FOR 132(10) COLUMNS IF TESTING THE FULL 132(10) COLUMNS. THE SECOND REFERENCE LINE PRINTS A STRING OF NUMBERS (1 TO 9 & 0) REPEATED TO THE MAXIMUM COLUMN. THIS LINE, AGAIN, CAN BE USED AS A QUICK CHECK OF THE NUMBER OF COLUMNS.

THE LINE FEED TEST IS ACCOMPLISHED BY: PRINTING THE FIRST REFERENCE LINE OF 0'S AND TWO 2'S; THEN EITHER SENDING 60(10) 3'S, IF TESTING 132(10) COLUMNS, OR WAITING 1.8 SECONDS FOR AN LCV, IF TESTING LESS THAN 132(10) COLUMNS. IF TESTING 132(10) COLUMNS, NOTHING SHOULD HAPPEN, EXCEPT FOR AN LCV, AT THE END OF THE LINE. THE 3'S SHOULD BE LOST AND NEVER PRINTED. AFTER THE LCV, WITH THE PRINT HEAD AT THE EXTREME RIGHT, A CARRIAGE RETURN - LINE FEED WILL BE SENT FOLLOWED BY REPEATED BACKSLASHES "\" AND LINEFEEDS TO PRINT A DIAGONAL LINE DOWN THE PAPER. WHEN A BACKSLASH IS PRINTED IN THE MAXIMUM COLUMN, A CARRIAGE RETURN WILL BE SENT IMMEDIATELY AFTER THE LINE FEED AND THE SECOND REFERENCE LINE OF SEQUENTIAL NUMBERS WILL BE PRINTED. AFTER COMPLETING THE LINE, A CARRIAGE RETURN - LINE FEED WILL BE SENT AND THE PROGRAM WILL WAIT ONE SECOND FOR THE CARRIAGE RETURN FUNCTION TO COMPLETE. AFTER THE DELAY, THE REFERENCE LINE WILL BE REPEATED, THE LAST LINE BEING GUARANTEED TO BE CORRECT. ANY TIMING PROBLEMS DURING THE LINE FEEDS WILL SHOW AS MISS PRINTS OR MISSING CHARACTERS DURING THE FIRST 16(10) CHARACTERS OF THE MIDDLE REFERENCE LINE. ALSO, ANY PAPER FEED PROBLEMS WILL CAUSE MISS-ALIGNMENT OF THE SLASHES FORMING THE DIAGONAL LINE.

EXAMPLE:

```
        000000000000000000000000000022
        \
         \
          \
           \
            \
             \
              \
               \
                \
                 \
                  \
                   \
                    \
                     \
                      \
                       \
                        \
                         \
                          \
                           \
                            \
                             \
                              \
                               \
                                \
                                 \
                                  \
                                   \
                                    \
                                     \
        123456789012345678901234567890
        123456789012345678901234567890
```

WITH THE AUTO LINE FEED OPTION SET TO PRODUCE AN AUTOMATIC LINE FEED AFTER EVERY RECEIVED CARRIAGE RETURN, THERE WILL BE A BLANK LINE EVERY PLACE A CARRIAGE RETURN IS EXECUTED.

EXAMPLE:

```
        0000000022
        \
         \
          \
           \
            \
             \
              \
               \
                \
                 \
        1234567890
        1234567890
```

6.1.7 TEST 6 - BACKSPACE TEST

THIS TEST IS DESIGNED TO TEST THE PRINT TIMING AS IN TEST 5 AS WELL AS THE BACKWARD AND FORWARD MOVEMENT OF THE PRINT SOLENOID HEAD.

THE TEST CONSISTS OF THE SAME FIRST REFERENCE LINE AS IN TEST 5, THEN A CARRIAGE RETURN-LINE FEED. A FULL LINE IS THEN PRINTED USING THE FOLLOWING PATTERN:

```
        FORWARD SLASH   "/"
        BACKSPACE
        BACK SLASH      "\"
```

THIS PATTERN PRODUCES A LINE OF ALL X'S. THE TWO SLASHES SHOULD CROSS EXACTLY AT THE MIDDLE, PRODUCING THE X CHARACTER. WHEN THE LINE IS COMPLETED A CARRIAGE RETURN-LINE FEED IS SENT AND THE LAST TWO REFERENCE LINES ARE PRINTED AS IN TEST 5. ANY TIMING PROBLEMS WILL SHOW IN THE FIRST 16(10) CHARACTERS OF THE MIDDLE REFERENCE LINE; AGAIN AS IN TEST 5.

WITH THE AUTO LINE FEED OPTION SET TO PRODUCE AN AUTOMATIC LINE FEED AFTER EVERY RECEIVED CARRIAGE RETURN, THERE WILL BE A BLANK LINE BETWEEN EACH PRINTED LINE.

EXAMPLE:

```
        000000000000000000000000000022
        XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
        123456789012345678901234567890
        123456789012345678901234567890
```

6.1.8 TEST 7 - OVERPRINT TEST

THIS TEST IS DESIGNED TO CHECK THE SPACING AND REPEATABLE PRINTING CHARACTERISTICS OF THE PRINTER. THREE ROWS OF CHARACTERS ARE EACH OVERPRINTED TWO TIMES. THE ROWS CONSIST OF THE FOLLOWING CHARACTERS ALTERNATED ACROSS THE LINE:

```
        ROW 1          M-SP
        ROW 2          SP-D
        ROW 3          $-SP
```

THE RESULTING PATTERN WILL BE A CHECKERBOARD PATTERN AND THE OVERPRINTED CHARACTERS SHOULD BE ALIGNED PROPERLY WITH THE INITIAL CHARACTERS.

EXAMPLE:

```
        M M M M M M M M M M M M M M M
         D D D D D D D D D D D D D D
        $ $ $ $ $ $ $ $ $ $ $ $ $ $ $
```

WITH THE AUTO LINE FEED OPTION SET TO PRODUCE AN AUTOMATIC LINE FEED AFTER EVERY RECEIVED CARRIAGE RETURN, THE LINES WILL NOT BE OVERPRINTED. THERE WILL BE THREE LINES OF EACH CHARACTER WITH A BLANK LINE BETWEEN EACH GROUP OF CHARACTERS. THE CHARACTERS IN EACH GROUP SHOULD BE IN THE SAME COLUMNS.

EXAMPLE:

```
        M M M M M M M M M M
        M M M M M M M M M M
        M M M M M M M M M M

         D D D D D D D D D
         D D D D D D D D D
         D D D D D D D D D

        $ $ $ $ $ $ $ $ $ $
        $ $ $ $ $ $ $ $ $ $
        $ $ $ $ $ $ $ $ $ $
```

6.1.9 TEST 10 - PRINTING FREQUENCY SWEEP TEST

THIS TEST PRINTS THE CHARACTER "H" REPEATEDLY, 30(10) CHARACTERS PER LINE FOR FOUR LINES. DURING THE FIRST TWO LINES, THE TIME INTERVAL BETWEEN CHARACTERS IS INCREASED FROM 30(10) MILLISECONDS TO 1.8 SECONDS USING THE FOLLOWING FORMULA TO CREATE A LOGRITHMIC INCREASE:

NEW DELAY = OLD DELAY + OLD DELAY/16 + OLD DELAY/128

THE LAST TWO LINES DO JUST THE REVERSE. THE TIME INTERVAL BETWEEN CHARACTERS IS DECREASED FROM 1.8 SECONDS TO 30(10) MILLISECONDS USING THE FOLLOWING FORMULA TO AGAIN CREATE A LOGRITHMIC DECREASE:

NEW DELAY = OLD DELAY - OLD DELAY/16 - OLD DELAY/128

LOOK FOR POSSIBLE MISS-ALIGNMENT OF THE CHARACTERS OR SPACES BETWEEN CHARACTERS AS AN INDICATION OF TIMING PROBLEMS.

WITH THE AUTO LINE FEED OPTION SET TO PRODUCE AN AUTOMATIC LINE FEED AFTER EVERY RECEIVED CARRIAGE RETURN, THERE WILL BE A BLANK LINE BETWEEN EACH PRINTED LINE.

EXAMPLE:

```
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
```

6.1.10 TEST 11 - RIBBON FEED TEST

THIS TEST CHECKS THE RIBBON FEED MECHANISM BY PRINTING A SINGLE COLUMN OF 24 LINES OF X'S DOWN THE LEFT HAND MARGIN OF THE PAGE. VISUALLY CHECK FOR PROPER OPERATION OF THE RIBBON FEED MECHANISM DURING THIS TEST.

WITH THE AUTO LINE FEED OPTION SET TO PRODUCE AN AUTOMATIC LINE FEED AFTER EVERY RECEIVED CARRIAGE RETURN, THERE WILL BE A BLANK LINE BETWEEN EACH PRINTED LINE.

EXAMPLE:

```
X
X
X
X
X
X
X
X
```

6.1.11 TEST 12 - PRINTER BELL TEST

THIS TEST CHECKS THE PRINTER BELL BUFFER TO INSURE THAT EIGHT BELLS ARE DISTINCTLY HEARD, EVEN WHEN SENT AT THE MAXIMUM TRANSFER RATE. THE PROGRAM SENDS 8 BELL CODES AT THE MAXIMUM RATE TO THE PRINTER THEN WAITS 2.5 SECONDS TO ALLOW THE OPERATOR TO HEAR THE BELLS.

6.1.12 TEST 17 - LIFE TEST

THIS TEST RUNS CONTINUOUSLY AND IS RUN AS AN INDIVIDUAL, SPECIAL TEST. IT IS NOT PART OF THE STANDARD PRINTING TEST SEQUENCE.

THIS TEST PRINTS 2 LINES OF EACH PRINTABLE CHARACTER AND THEN REPEATS CONTINUOUSLY. THE SECOND LINE OF EACH CHARACTER IS OVERPRINTED 4 TIMES TO CONSERVE PAPER. AT THE END OF EACH COMPLETE PASS THROUGH THE CHARACTER SET A MESSAGE IS PRINTED INDICATING THE NUMBER OF PASSES EXECUTED. IF ANY CHARACTER (EXCEPT "RUBOUT") IS TYPED ON THE KEYBOARD DURING THIS TEST, THE PATTERN WILL CHANGE AND RESTART WITH THE TYPED CHARACTER. THIS WILL ONLY HAPPEN IF KEYBOARD CONTROL IS IN USE.

EXAMPLE:

```
          AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
          AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
          BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
          BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
```

IF THE AUTO LINE FEED OPTION IS SET TO PRODUCE AN AUTOMATIC LINE FEED AFTER EVERY RECEIVED CARRIAGE RETURN, THE TEST WILL PRINT SIX LINES OF EACH CHARACTER WITH A BLANK LINE BETWEEN THE FIRST AND SECOND LINES AS WELL AS BETWEEN EACH GROUP OF CHARACTERS.

EXAMPLE:

```
          AAAAAAAAAAAAAAAA

          AAAAAAAAAAAAAAAA
          AAAAAAAAAAAAAAAA
          AAAAAAAAAAAAAAAA
          AAAAAAAAAAAAAAAA
          AAAAAAAAAAAAAAAA

          BBBBBBBBBBBBBBBB

          BBBBBBBBBBBBBBBB
          BBBBBBBBBBBBBBBB
          BBBBBBBBBBBBBBBB
          BBBBBBBBBBBBBBBB
          BBBBBBBBBBBBBBBB
```

6.2 ECHO TESTS

THESE TESTS ARE DESIGNED AS A TEST OF THE KEYBOARD AND AN AID IN ISOLATING TROUBLES WITHIN THE TERMINAL. AT THE BEGINNING OF EACH TEST, THE TEST NUMBER WILL BE PRINTED INDICATING WHICH TEST IS BEING EXECUTED. TYPING A "RUBOUT" OR "DELETE" AT ANY TIME, WHETHER IN KEYBOARD CONTROL OR NOT, WILL EXIT THE CURRENT ECHO TEST AND PRINT A TEST TERMINATION MESSAGE. IF IN KEYBOARD CONTROL, THE SELECT TEST MESSAGE WILL BE PRINTED AND THE PROGRAM WILL AWAIT A TEST SELECTION AS USUAL. IN SWITCH REGISTER CONTROL, THE PROGRAM WILL HALT (AT SELLHLT) WAITING FOR CONTROL VIA THE SWITCH REGISTER. A DETAILED DESCRIPTION OF EACH TEST FOLLOWS:

6.2.1 TEST 20 - CHARACTER ECHO TEST

THIS TEST IS DESIGNED TO OPERATE THE TERMINAL IN A SIMULATED LOCAL MODE. ANY CHARACTER TYPED ON THE KEYBOARD (EXCEPT A "RUBOUT") WILL BE ECHOED TO THE PRINTER.

6.2.2 TEST 21 - LINE ECHO TEST, FAST RATE

THIS TEST CONTINUALLY SENDS FULL LINES OF ANY CHARACTER UP TO THE MAXIMUM COLUMN WIDTH. THE TEST PRINTS A "0" CHARACTER WHEN STARTED UNTIL A KEY IS TYPED ON THE KEYBOARD. THE PROGRAM WILL THEN SEND THE TYPED CHARACTER UNTIL ANOTHER CHARACTER IS TYPED OR THE TEST IS TERMINATED BY TYPING A "RUBOUT". THE CHARACTERS ARE TRANSMITTED AT THE MAXIMUM RATE WITH A CARRIAGE RETURN-LINE FEED INSERTED AFTER EVERY 132(10) PRINTABLE CHARACTERS.

IF THE LA36 IS IN HALF DUPLEX WHEN RUNNING THIS TEST, CHARACTERS MAY BE LOST OR GARBLED WHENEVER A CHARACTER IS TYPED ON THE KEYBOARD.

WITH THE AUTO LINE FEED OPTION SET TO PRODUCE AN AUTOMATIC LINE FEED AFTER EVERY CARRIAGE RETURN, THERE WILL BE A BLANK LINE BETWEEN EACH PRINTED LINE.

6.2.3 TEST 22 - LINE ECHO TEST, SLOW RATE

THIS TEST IS IDENTICAL TO TEST 21, EXCEPT A DELAY OF 1.5 SECONDS IS INSERTED BETWEEN EACH CHARACTER TO ALLOW THE PRINT HEAD TO PERFORM AN LCY BETWEEN CHARACTERS.

6.2.4 TEST 23 - CHARACTER CODE ECHO TEST

THIS TEST WILL PRINT THE OCTAL CODE RECEIVED BY THE PROCESSOR FOLLOWED BY THE CHARACTER OR THE MNEMONIC OF THE CHARACTER EVERY TIME A KEY IS PRESSED ON THE KEYBOARD. THE PARITY OF THE RECEIVED CODE WILL BE INDICATED AS EITHER ODD OR EVEN. ALLOW SUFFICIENT TIME BETWEEN CHARACTERS FOR THE LINE TO BE PRINTED.

WITH THE AUTO LINE FEED OPTION SET TO PRODUCE AN AUTOMATIC LINE FEED AFTER EVERY RECEIVED CARRIAGE RETURN, THERE WILL BE A BLANK LINE BETWEEN EACH PRINTED LINE.

EXAMPLE:

```
        301   A     ODD
        263   3     ODD
        215   CR    EVEN
        240   SP    EVEN
```

6.2.5 TEST 24 - SELECTED PATTERN ECHO TEST

THIS TEST IS DESIGNED TO GIVE MAINTENANCE THE FLEXIBILITY TO CHOOSE THEIR OWN PATTERNS FOR ISOLATING ANY SPECIFIC PROBLEMS WHICH MAY ARISE IN THE FIELD.

TYPE ANY CHARACTERS (EXCEPT CONTROL-C AND RUBOUT) AND EACH CHARACTER WILL BE ECHOED AS TYPED. A MAXIMUM OF 256(10) CHARACTERS MAY BE INPUTTED. NO CARRIAGE RETURNS OR LINE FEEDS ARE INSERTED BY THE PROGRAM. ALL CHARACTERS MUST BE INPUTTED BY THE OPERATOR. TO TERMINATE THE INPUT STRING TYPE A CONTROL-C. THE PROGRAM WILL THEN CONTINUALLY ECHO THE INPUTTED PATTERN. TO STOP THE PRINTING, TYPE CONTROL-C. THE PROGRAM WILL STOP PRINTING THE PATTERN AND WILL WAIT FOR EITHER ANOTHER PATTERN INPUT TERMINATED BY A CONTROL-C, OR THE SAME PATTERN MAY BE USED AGAIN BY TYPING CONTROL-C. TO EXIT THE TEST AT ANY TIME, TYPE A "RUBOUT".

WHEN ANY OPTIONS ARE AVAILABLE, BE CAREFUL WHAT CHARACTERS OR CHARACTER SEQUENCES ARE SELECTED.

6.2.6 TEST 25 - BELL ECHO TEST

THIS TEST IS DESIGNED TO TEST THE BELL ON COLUMN 64 IF TYPING HAS OCCURED ON THE LINE. THE TEST PRINTS A MESSAGE:

```
     TYPE ANY PRINTABLE CHARACTER AND LISTEN FOR BELL ...........
```

AFTER THE TEST MESSAGE IS PRINTED, TYPE ANY PRINTABLE CHARACTER ON THE KEYBOARD. THE CHARACTER WILL BE ECHOED AND THE BELL SHOULD RING. THE MESSAGE WILL THEN BE TYPED AGAIN. TYPE THE "RUBOUT" KEY TO TERMINATE THE TEST AT ANY TIME.

6.3 OPTION TESTS

THESE TESTS ARE DESIGNED AS A TEST OF THE VARIOUS OPTIONS IN WHATEVER COMBINATIONS THEY ARE AVAILABLE IN THE LA36. AT THE BEGINNING OF EACH TEST, THE TEST NUMBER WILL BE PRINTED INDICATING WHICH TEST IS BEING EXECUTED. TYPING A "RUBOUT" OR "DELETE" AT ANY TIME, WHETHER IN KEYBOARD CNTROL OR NOT, WILL EXIT THE CURRENT OPTION TEST. A DETAILED DESCRIPTION OF EACH TEST FOLLOWS:

6.3.1 TEST 30 - SECONDARY CHARACTER SET OPTION

THIS TEST IS DESIGNED TO TEST THE SECONDARY CHARACTER SET OPTION, TESTING THE ABILITY TO SELECT EITHER CHARACTER SET UNDER SOFTWARE CONTROL FROM THE CPU AND PRINTING THE CORRECT CHARACTERS WITHIN EACH CHARACTER SET.

A NUMBER IS PRINTED AT THE LEFT MARGIN INDICATING WHICH CHARACTER SET IS BEING PRINTED, #1 INDICATES THE PRIMARY SET AND #2 INDICATES THE SECONDARY SET (APL). AFTER THE NUMBER, THE APPROPRIATE SHIFT IN (SI) OR SHIFT OUT (SO) WILL BE SENT FOLLOWED BY THE ENTIRE PRINTABLE CHARACTER SET. IF LESS THAN 98 COLUMNS ARE BEING TESTED, A CARRIAGE RETURN - LINE FEED WILL BE INSERTED IN THE APPROPRIATE PLACES. THIS WILL BE REPEATED, ALTERNATING BETWEEN PRIMARY AND SECONDARY SETS UNTIL 16 LINES HAVE BEEN PRINTED (IF USING 98 OR MORE COLUMNS). THERE WILL BE A BLANK LINE BETWEEN EACH PAIR OF LINES TO SEPARATE EACH GROUPING. CHANGE LOCATION "T30SC" AT THE END OF TEST30 TO 377 (8) IF USING 8 BIT SELECTION CODE RATHER THAN THE SI AND SO TO SELECT CHARACTER SETS. THE TEST WILL THEN SET OR CLEAR BIT 8 INSTEAD OF SENDING THE SI OR SO TO SELECT CHARACTER SETS.

WITH THE AUTO LINE FEED OPTION SET TO PRODUCE AN AUTOMATIC LINE FEED AFTER EACH RECEIVED CARRIAGE RETURN, THERE WILL BE EXTRA BLANK LINES EVERY PLACE A CARRIAGE RETURN IS SENT.

EXAMPLE:

```
          #1= !"#$%&'()........PRIMARY CHARACTER SET..........
          #2= !"#$%&'().......SECONDARY CHARACTER SET.........

          #1= !"#$%&'()........PRIMARY CHARACTER SET..........
          #2= !"#$%&'().......SECONDARY CHARACTER SET.........
```

6.3.2 TEST 31 - SELECTIVE ADDRESSING OPTION

THIS TEST IS DESIGNED TO TEST THE VARIOUS FUNCTIONS OF THE SELECTIVE ADDRESSING OPTION. THE TEST FIRST SENDS AN "EOT" <004> TO DISABLE ALL TERMINALS AND TRIES TO PRINT AN ERROR MESSAGE. THE ERROR MESSAGE SHOULD NOT BE PRINTED ON ANY TERMINAL WITH THE SELECTIVE ADDRESSING OPTION. THEN A "BEL" <007> AND "STX" <002> ARE SENT TO SELECT ALL TERMINALS. AT THIS POINT THE TEST NUMBER IS PRINTED ON ALL TERMINALS. THUS, IF AN ERROR MESSAGE IS PRINTED BEFORE THE TEST NUMBER, THE EOT DID NOT DE-SELECT THE TERMINAL WHERE THE MESSAGE WAS PRINTED.

THE TEST NEXT SENDS AN EOT DIRECTLY FOLLOWED BY A STX, WITH NO SELECT CHARAACTER. AGAIN, THE ERROR MESSAGE IS SENT TO ALL TERMINALS, WHICH SHOULD NOW BE ALL DE-SELECTED. THE ERROR MESSAGE SHOULD NOT BE PRINTED ON ANY TERMINAL WITH THE SELECTIVE ADDRESSING OPTION.

THE NEXT SERIES OF CHECKS ARE MADE ON THE GROUP SELECT CHARACTER. A TABLE LOCATED AT THE END OF TEST 31 IN THE LISTING IS USED TO TEST VARIOUS GROUP SELECT CHARACTERS. THE FIRST ZERO ENCOUNTERED IN THE TABLE WILL INDICATE THE END OF THE TABLE AND THE TEST WILL GO TO THE NEXT SERIES OF CHECKS ON THE OPTION. THE TABLE IS PRESET WITH A SINGLE GROUP SELECT CHARACTER, THE LETTER "G", BUT ALLOWS ROOM TO TEST UP TO 8 DIFFERENT SELECT CODES. THIS TABLE SHOULD BE CHANGED TO CONTAIN THE VARIOUS GROUP SELECT CHARACTERS DESIRED TO TEST WITH ONE ASCII CODE PER LOCATION. THE TEST WILL THEN USE THE VARIOUS GROUP SELECT CHARACTERS TO SELECT TERMINALS AND PRINT A MESSAGE ON EACH SELECTED TERMINAL INDICATING THE GROUP SELECT CHARACTER USED. CHECK THAT THE CORRECT GROUP SELECT CHARACTER HAS ENABLED EACH TERMINAL. ALSO, IT MAY BE HELPFUL TO PLACE ;UNUSED SELECT CHARACTERS IN THE TABLE TO CHECK THAT THEY DO NOT SELECT TERMINALS. IF AN ERROR MESSAGE WAS PRINTED BETWEEN THE TEST NUMBER AND THE GROUP SELECT MESSAGE, THE TERMINAL WHERE THE MESSAGE WAS PRINTED WAS SELECTED BY AN EOT AND STX WITH NO SELECT CHARACTER BETWEEN THEM.

THE LAST SERIES OF CHECKS ARE MADE ON THE UNIQUE SELECT CHARACTER. A TABLE LOCATED AT THE END OF TEST 31 IN THE LISING IS USED TO TEST VARIOUS UNIQUE SELECT CHARACTERS. THE FIRST ZERO ENCOUNTERED IN THE TABLE WILL INDICATE THE END OF THE TABLE. THE PROGRAM WILL SELECT ALL TERMINALS USING THE BEL CODE BEFORE EXITING THE TEST. THE TABLE IS PRESET WITH A SINGLE UNIQUE SELECT CHARACTER, THE LETTER "U", BUT ALLOWS ROOM TO TEST UP TO 16 DIFFERENT UNIQUE SELECT CODES. THIS TABLE SHOULD BE CHANGED TO CONTAIN THE VARIOUS UNIQUE SELECT CHARACTERS DESIRED TO TEST, WITH ONE ASCII CODE PER LOCATION. MAKE SURE THAT EACH CHARACTER IN THE TABLE IS A VALID UNIQUE SELECT CODE OR THE DIAGNOSTIC WILL HANG DURING THIS PORTION OF THE TEST. USING EACH UNIQUE SELECT CHARACTER IN TURN, THE TEST WILL PERFORM THE REMAINING CHECKS OF THE SELECTIVE ADDRESSING OPTION.

THE TEST WILL SEND AN EOT FOLLOWED BY THE CURRENT UNIQUE SELECT CHARACTER. BEFORE THE STX IS SENT, THE TEST WILL TRY TO PRINT THE ERROR MESSAGE ON ALL TERMINALS. THEN THE STX WILL BE SENT AND A MESSAGE WILL BE PRINTED TO INDICATE THE UNIQUE SELECT CHARACTER USED. CHECK THAT THE CORRECT UNIQUE SELECT CHARACTER HAS ENABLED EACH TERMINAL. IF AN ERROR MESSAGE IS PRINTED BEFORE THE UNIQUE SELECT MESSAGE, THE TERMINAL WHERE THE MESSAGE WAS PRINTED WAS ENABLED BEFORE THE STX WAS RECEIVED. A MESSAGE WILL THEN BE PRINTED TELLING THE OPERATOR TO TYPE ANY PRINTABLE CHARACTER TO CHECK THAT THE KEYBOARD IS ENABLED. WHATEVER CHARACTER IS TYPED WILL BE ECHOED TO THE TERMINAL.

THE FINAL SECTION OF THE TEST WILL USE A DUMMY SELECT CHARACTER. THE ASCII CODE FOR THIS SELECT CHARACTER IS LOCATED BETWEEN THE TWO SELECT CHARACTER TABLE AT THE END OF THE TEST. THIS LOCATION SHOULD CONTAIN THE ASCII CODE OF ANY UNUSED SELECT CHARACTER. THE TEST WILL SEND AN EOT FOLLOWED BY THE DUMMY SELECT CHARACTER AND AN STX. THE ERROR MESSAGE WILL BE LOADED TO ALL TERMINALS AND SHOULD NOT BE PRINTED ON ANY TERMINALS SINCE ALL SHOULD BE DE-SELECTED. NEXT AN ETX <003> FOLLOWED BY THE CURRENT UNIQYUE SELECT CHARACTER AND AN STX WILL BE SENT AND A PRINTED MESSAGE WILL INDICATE THE SELECT CHARACTER USED. ANOTHER EXT WILL BE SENT, FOLLOWED BY THE DUMMY SELECT CHARACTER AND AN STX THIS TIME. A MESSAGE WILL AGAIN BE PRINTED INDICATING THE CURRENT UNIQUE SELECT CHARACTER. ALL SELECTED TERMINALS SHOULD REMAIN SELECTED AND NO OTHER TERMINALS SHOULD GET SELECTED.

6.3.3 TEST 32 - ANSWER BACK OPTION

THIS TEST IS DESIGNED TO TEST THAT THE ANSWER BACK OPTION SENDS THE CORRECT MESSAGE UPON RECEIPT OF AN ENQ (005) OR UPON TYPING CONTROL-E OR THE HERE IS KEY ON THE KEYBOARD. THE TEST WILL SEND AN ENQ (005), READ THE MESSAGE, AND THEN PRINT OUT THE MESSAGE ON THE LA36. THE TEST WILL THEN ASK THE OPERATOR TO DEPRESS THE HERE IS KEY, READ THE MESSAGE, AND THEN PRINT OUT THE MESSAGE. FINALLY, THE TEST WILL TELL THE OPERATOR TO DEPRESS THE CONTROL-E KEY, READ THE MESSAGE, AND PRINT OUT THE MESSAGE. IF THE SELECTIVE ADDRESSING OPTION IS AVAILABLE, THE AUTO ANSWER BACK OPTION WILL NOT RESPOND TO ANOTHER ENQ AFTER THE FIRST ONE RECEIVED. THUS, YOU MAY HAVE TO DEPRESS THE RUBOUT KEY TO EXIT THE TEST.

6.3.4 TEST 33 - TOP OF FORM OPTION

THIS TEST IS DESIGNED TO TEST THE FORM FEED CAPIBILITY OF THE TOP OF FORM OPTION. A SET OF INSTRUCTIONS IS PRINTED FOR THE OPERATOR TO REMIND HIM TO DEPRESS THE TOP OF FORM RESET SWITCH AFTER MAKING EACH SWITCH SETTING. UPON COMPLETION OF EACH SETTING, AFTER DEPRESSING THE RESET SWITCH, TYPE ANY CHARACTER (EXCEPT RUBOUT) ON THE KEYBOARD TO TEST THAT SWITCH SETTING. THE REFERENCE LINES PRINTED WILL INDICATE THE LENGTH FORM FEED JUST EXECUTED AND THE NEXT SWITCH SETTING TO MAKE. THE 3 INCH FORM FEED IS TESTED TWICE BEFORE TESTING THE REMAINING POSITIONS. THE FIRST TIME, 16 OR 17 LINE FEEDS ARE EXECUTED BEFORE DOING THE FORM FEED, DEPENDING ON HOW THE AUTO LINE FEED OPTION IS SET UP. THE DIAGNOSTIC WILL THEN TEST EACH POSITION IN SEQUENCE FROM 3 TO 14 INCHES. THE SINGLE STEP POSITION IS NOT CHECKED.

6.3.5 TEST 34 - HORIZONTAL TAB OPTION

THIS TEST CHECKS THE ABILITY TO SET A TAB IN EVERY COLUMN AND AT PREDETERMINED INTERVALS, AS WELL AS THE ABILITY TO CLEAR ALL TABS. THE PROGRAM SETS A TAB IN THE PREDETERMINED COLUMN, DOES A BACKSPACE, AND PRINTS AN "0". AFTER THE LINE IS PRINTED AND THE TABS ARE SET, A CARRIAGE RETURN IS SENT AND THEN THE PRINT HEAD IS POSITIONED USING TABS AND X'S ARE PRINTED OVER THE 0'S. SINCE THE FIRST LINE OF THE TEST SETS A TAB IN EVERY COLUMN, THE PRINT HEAD IS TABED ACROSS THE PAGE TWICE TO TEST ALL TABS. THE FIRST PASS CHECKS THE EVEN NUMBERED COLUMNS WHILE THE SECOND PASS CHECKS THE ODD NUMBERED COLUMNS. THE TEST SETS TABS IN EVERY COLUMN, EVERY OTHER COLUMN, AND EVERY 4, 8, 16, 32, 64, 128, & 132 COLUMNS. ALL HORIZONTAL TABS WILL BE CLEARED AT THE END OF THE TEST IF THE TEST IS RUN TO COMPLETION. IF A RUBOUT IS USED TO EXIT THE TEST BEFORE COMPLETION, THE TABS WILL STILL BE SET.

EXAMPLE:

```
          0000000000
           0 0 0 0 0
             0   0
                 0
```

WHEN THE AUTO LINE FEED OPTION IS SET UP TO PRODUCE AN AUTOMATIC LINE FEED AFTER EVERY RECEIVED CARRIAGE RETURN, THERE WILL BE A BLANK LINE BEFORE EACH REFERENCE LINE OF 0'S AND THE X'S WIL BE PRINTED ON THE NEXT LINE UNDER THE 0'S. THE FIRST LINE OF 0'S WILL HAVE 2 LINES OF X'S UNDER IT, THE FIRST HAVING X'S IN ALL EVEN NUMBERED COLUMNS AND THE SECOND HAVING X'S IN ALL ODD NUMBERED COLUMNS.

EXAMPLE:

```
        000000000000
         X X X X X X
        X X X X X X

         0 0 0 0 0 0
         X X X X X X

           0   0   0
           X   X   X

               0
               X
```

6.3.6 TEST 35 - VERTICAL TAB OPTION

THIS TEST CHECKS THE VERTICAL TAB OPTION BY TESTING THE ABILITY TO SET TABS IN VARIOUS POSITIONS OF A 14 INCH FORM. AN INSTRUCTION IS PRINTED TELLING THE OPERATOR TO SET A 14 INCH FORM LENGTH AND DEPRESS THE TOP OF FORM RESET SWITCH. WHEN READY, TYPE ANY CHARACTER (EXCEPT RUBOUT) ON THE KEYBOARD TO CONTINUE. THE TEST WILL SEND LINE FEEDS, SET TABS, AND PRINT REFERENCE LINES WHEREVER A TAB IS SET. AT THE END OF THE FORM, A MESSAGE WILL INDICATE TO EITHER REMOVE THE REFERENCE PAGE (WITHOUT TOUCHING THE KEYBOARD) OR RESET THE FIRST REFERENCE LINE. TO RESET THE REFERENCE PAGE IN THE PRINTER, OPEN THE PAPER TRACTORS AND PLACE THE FIRST REFERENCE LINE INFRONT OF THE PRINT HEAD. WHEN READY TO CONTINUE, TYPE ANY CHARACTER (EXCEPT RUBOUT) ON THE KEYBOARD. THE TEST WILL THEN REPRINT THE REFERENCE LINES, USING THE TABS INSTEAD OF LINE FEEDS TO ADVANCE THE PAPER. IF THE FIRST REFERENCE PAGE WAS REMOVED, HOLD IT AGAINST THE SECOND REFERENCE PAGE TO CHECK FOR PROPER PAPER ADVANCING USING TABS. IF THE REFERENCE PAGE WAS RESET IN THE PRINTER, THE SECOND SET OF REFERENCE LINES SHOULD HAVE PRINTED DIRECTLY OVER THE FIRST SET EXCEPT ON THE FIRST LINE WHERE THEY SHOULD BE SIDE-BY-SIDE. ALLOW FOR A SLIGHT VARIANCE IN PAPER POSITION WHEN CHECKING THAT THE REFERENCE LINES ARE CORRECT. LOOK FOR FULL LINE DIFFERENCES. THE TEST PRODUCES 0,1,2,3,4,5,6,7,8,9, & 10 BLANK LINES BETWEEN THE REFERNECES LINES, IN THAT ORDER.

EXAMPLE:

```
          --------<<<<<<<<     --------<<<<<<<<
          --------<<<<<<<<         !
                                   !
          --------<<<<<<<<         !
                                   '----- FIRST REF.  LINE WITH TABS


          --------<<<<<<<<



          --------<<<<<<<<




          --------<<<<<<<<
```

THE REFERENCE PATTERN PRODUCED WILL BE DIFFERENT IF THE AUTO LINE FEED OPTION IS SET UP TO PRODUCE AN AUTOMATIC LINE FEED AFTER EVERY RECEIVED CARRIAGE RETURN. THERE WILL, IN FACT, BE ONE EXTRA LINE BETWEEN EACH REFERENCE LINE DUE TO THE AUTO LINE FEED.

EXAMPLE:

```
          --------<<<<<<<<     --------<<<<<<<<

          --------<<<<<<<<


          --------<<<<<<<<



          --------<<<<<<<<




          --------<<<<<<<<
```

N02

```
                                .TITLE  MAINDEC-11-DZLAD-C


                        ;LA36 TERMINAL DIAGNOSTIC
                        ;DH11 AND DJ11 INTERFACES


                        ;AUTHOR:   ROBERT W. BAKER

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                                .SBTTL  SWITCH REGISTER OPTIONS

                        ;       SWITCH  POSITION        FUNCTION
                        ;
                        ;       15      UP (1)          HALT AT END OF CURRENT TEST
                        ;               DOWN (0)        CONTINUE NORMAL TEST SEQUENCE
                        ;
                        ;       13      UP (1)          DRIVE ONLY SELECTED TERMINAL
                        ;               DOWN (0)        DRIVE ALL TERMINALS
                        ;
                        ;       8       UP (1)          SELECT TEST (AT START UP ONLY)
                        ;               DOWN (0)        START NORMAL TEST SEQUENCE
                        ;
                        ;      00 - 07                  # OF COLUMNS AT START-UP


                                .SBTTL  SPECIAL OPERTIONAL NOTES


                        ;1.--   BEFORE START UP REFER TO THE DESCRIPTION OF THE ROUTINE "DLY"
                        ;       TIMING IS A FUNCTION OF THE PDP11 MODEL AND MEMORY TYPE AND
                        ;       SHOULD BE SET UP BEFORE RUNNING THE DIAGNOSTIC.

                        ;2.--   THE DIAGNOSTIC WILL NOT RUN UNLESS THE ELTAB TABLE IS MANUALLY INITIALIZED.
```

```
                                        .SBTTL  EQUATES

                                  ;     REGISTER EQUATES

        000000                          R0=%0
        000001                          R1=%1
        000002                          R2=%2
        000003                          R3=%3
        000004                          R4=%4
        000005                          R5=%5
        000006                          SP=%6
        000007                          PC=%7


                                  ;     SYSTEM EQUATES

        000001                          BIT0=1
        000002                          BIT1=2
        000004                          BIT2=4
        000010                          BIT3=10
        000020                          BIT4=20
        000040                          BIT5=40
        000100                          BIT6=100
        000200                          BIT7=200
        000400                          BIT8=400
        001000                          BIT9=1000
        002000                          BIT10=2000
        004000                          BIT11=4000
        010000                          BIT12=10000
        020000                          BIT13=20000
        040000                          BIT14=40000
        100000                          BIT15=100000

        000000                          OPEN=0
        022626                          POPSP2=22626            ;POP STACK TWICE
        000200                          ACRLF=200
```

D03

```
                                        ;       PROGRAM TRAP EQUATES

                104000                          TYPE=EMT+0
                104001                          CHAIN=EMT+1
                104002                          TYPEN=EMT+2
                104003                          DELAY=EMT+3
                104004                          TTYCTL=EMT+4
                104005                          TTYJTL=EMT+5
                104006                          CRLF=EMT+6
                104007                          SCRLF=EMT+7
                104010                          LF=EMT+10
                104011                          PRINTC=EMT+11
                104012                          PRTHDR=EMT+12
                104013                          READ=EMT+13
                104014                          SR=EMT+14
                104015                          BTOASC=EMT+15
                104016                          FORWD=EMT+16
                104017                          SCAN=EMT+17
                104020                          TESTC=EMT+20
                104021                          [illegible]=EMT+21
                104022                          [illegible]=EMT+22
```

```
                                        .SBTTL  TRAP CATCHER & STARTING ADDRESSES


                                        .ENABL  ABS
                                        .ENABL  AMA             ;ENABLE ABSOLUTE ADDRESSING

        000000                          .=0

000000  000000                          HALT
000002  000000                          HALT

        000004                          .=4

000004                          MACHER:

        000030                          .=30

000030  003256                          EMTINT
000032  000340                          340

        000046                          .=46

000046  010570                          LOGICAL

        000052                          .=52

000052  010000                          010000

        000174                          .=174

000174  000000                  DISPREG:        .WORD   0       ;SOFTWARE DISPLAY REG
000176  000000                  SWREG:          .WORD   0       ;SOFTWARE SWITCH REGISTER

                                ;STARTING ADDRESSES

000200  000137  001256                  JMP     START           ;RUN    DZ11 TESTS
000204  000137  001246                  JMP     START1          ;RUN    DZ11 TESTS


        001100                          .=1100

001100  000000                  SPBOT:  0                       ;BOTTOM OF STACK
```

```
                                              .SBTTL  SYMBOL DEFINITIONS


     001102  000554                           TIMER:  554               ;1 MSEC COUNTER FOR ROUTINE "DELAY"

     001104  000000                           CNTLSW: OPEN              ;CONSOLE TERMINAL CONTROL SWITCH
     001106  000000                           RTNNO:  OPEN              ;CONTAINS CURRENT TEST NUMBER
     001110  000000                           NXTST:  OPEN              ;CONTAINS ADDRESS OF NEXT TEST
     001112  000000                           WIDTH:  OPEN              ;CURRENT PAPER WIDTH, BINARY
     001114  000000                           REPT:   OPEN              ;TEMP STORAGE FOR TESTS E021&E022
     001116  000000                           SPCNT:  OPEN              ;COUNTER FOR TEST ROUTINE "PT3"
     001120  000000                           CURTST: OPEN              ;ADDRESS OF CURRENT TEST
     001122  000000                           POSI:   OPEN              ;POSITION COUNTER FOR TESTS E021&E022
     001124  000000                           TEMPCH: OPEN              ;TEMP STOR FOR ECHO TESTS
     001126  000000                           PARITY: OPEN              ;PARITY FLAG
     001130  000000                           PCHAR:  OPEN              ;CHAR CODE WITH PARITY BIT
     001132  000000                           LFCNT:  OPEN              ;COUNTER FOR TEST ROUTINE "PT4"
     001134  160020                           DHADR:  160020            ;ADDRESS OF FIRST DH11.(RECALCULATED)
     001136  160020                           SCR:    160020            ;SYSTEM CONTROL REGISTER
     001140  160022                           NRCRA:  160022            ;NEXT RECEIVED CHARACTER REG.
     001142  160024                           LPR:    160024            ;LINE PARAMETER REG
     001144  160026                           CARA:   160026            ;CURRENT ADDRESS REGISTER
     001146  160030                           BYCR:   160030            ;BYTE COUNT REG
     001150  160032                           BAR:    160032            ;BUFFER ACTIVE REG
     001152  160036                           SSR:    160036            ;SILO STATUS REG
     001154  000000                           CNTDH:  OPEN              ;NO. OF THE DH11 UNDER TEST
     001156  000000                           LINENO: OPEN              ;NO. OF THE TERMINAL UNDER TEST
     001160  000000                           MASK:   OPEN              ;MASK OF LINE NO. UNDER TEST
     001162  000001  000002  000004           BITTAB: 1,2,4             ;TABLE OF LINE NO. MASKS
     001170  000010  000020  000040                   10,20,40
     001176  000100  000200  000400                   100,200,400
     001204  001000  002000  004000                   1000,2000,4000
     001212  010000  020000  040000                   10000,20000,40000
     001220  100000                                   100000
     001222  000000                           ACTIV:  OPEN              ;TEST ACTIVE INDICATOR
     001224  000000                           IOSW:   OPEN              ;=0,DH11 UNDER TEST--=1,DJ11 UNDER TEST
     001226  000000                           DJCNT:  OPEN              ;COUNT OF DJ11'S ON BUS
     001230  000000                           DHCNT:  OPEN              ;COUNT OF DH11'S ON BUS
     001232  000000                           SCR1:   OPEN              ;TEMP STORAGE USED BY PRINTC
     001234  000000                           SCR2:   OPEN              ;TEMP STORAGE USED BY PTINTC
     001236  160010                           CSR:    160010            ;DJ11 CONTROL STATUS REG
     001240  160014                           TCR:    160014            ;DJ11TRANSMITTER CONTROL REG
     001242  160016                           TBUF:   160016            ;DJ11 TRANSMITTER BUFFER REG
     001244  177570                           SR:     177570            ;SW REG ADDRESS
```

```
                                                       .SBTTL  PROGRAM INITIALIZATION & CONTROL



                                               ;*********
                                               ;
                                               ;PROGRAM START
                                               ;
                                               ;*********

       001246  012737  177777  001224  START1: MOV     #177777,IOSW    ;SET UP FOR DJ11 TEST
       001254  000402                          BR      STARTX
       001256  005037  001224          START:  CLR     IOSW            ;SET UP FOR DH11 TESTS

       001262  012706  001100          STARTX: MOV     #SPBOT,SP       ;SET STACK POINTER
       001266  013746  000006                  MOV     6,-(SP)         ;SAVE CURRENT VECTORS
       001272  013746  000004                  MOV     4,-(SP)
       001276  012737  001312  000004          MOV     #10$,4          ;SET TIMEOUT VECTOR
       001304  005777  177734                  TST     @SR             ;TRY REFFERENCING SW REG
       001310  000404                          BR      11$             ;BRANCH IF DID NOT TIME OUT
       001312  012737  000176  001244  10$:    MOV     #SWREG,SR       ;POINT TO SOFTWARE SW REG
       001320  022626                          CMP     (SP)+,(SP)+     ;RESET STACK
       001322  012637  000004          11$:    MOV     (SP)+,4         ;RESET VECTOR
       001326  012637  000006                  MOV     (SP)+,6
       001332  104011                          CLEAN                   ;CLEAN UP
       001334  005037  001104                  CLR     INTLSW          ;INITIALIZE TERMINAL CONTROL SWITCH
       001340  012737  004100  000024          MOV     #PFAIL,24       ;SET ADDR POWER FAIL ROUTINE
```

```
                                                ;**********
                                                ;
                                                ;THIS NEXT PART CHECKS THE PRESENCE OF DJ11 OR DH11
                                                ;STARTING AT 776010. A MESSAGE WILL BE PRINTED ON
                                                ;THE CONSOLE TERMINAL INDICATING THE NUMBER
                                                ;PRESENT. THE PRINTER DIAGNOSTIC WILL ADDRESS EACH OF
                                                ;THE TERMINALS IN THE SYSTEM
                                                ;
                                                ;**********
 001346  012737  001400  000004                         MOV     #END3,MACHER      ;INIT TIME OUT TRAP
 001354  005037  001226                                 CLR     DJCNT    .        ;CLEAR DJ11 COUNTER
 001360  012700  160010                                 MOV     #160010,R0        ;ADDR OF FIRST DJ11
 001364  005710                                 1$:     TST     (R0)              ;REF DJ11
 001366  062700  000010                                 ADD     #10,R0            ;SET R0 TO NEXT DJ11
 001372  005237  001226                                 INC     DJCNT             ;INCREMENT COUNT OF DJ11'S
 001376  000772                                         BR      1$                ;TEST PRESENCE OF NEXT DJ11

 001400  022626                                 END3:   POPSP2                    ; POP 2 FROM STACK
 001402  030027  000010                                 BIT     R0,#10            ;CHECK IF R0 IS MULTIPLE OF 20
 001406  001402                                         BEQ     1$                ;SKIP IF YES
 001410  062700  000010                                 ADD     #10,R0            ;MAKE R0 FIRST DH11 ADDR
 001414  010037  001134                         1$:     MOV     R0,DHADR          ;SAVE AS FIRST DH11 ADDRES
 001420  012737  001446  000004                         MOV     #END4,MACHER      ;SET TIME OUT TRAP
 001426  005037  001230                                 CLR     DHCNT             ;CLEAR COUNT OF DH11'S
 001432  005710                                 2$:     TST     (R0)              ;TEST IF DH11 IS PRESENT
 001434  062700  000020                                 ADD     #20,R0            ;YES, SET R0 TO NEXT DH11
 001440  005237  001230                                 INC     DHCNT             ;INCREMENT COUNT OF DH11'S
 001444  000772                                         BR      2$                ;CHECK IF NEXT ONE IS PRESENT

 001446  022626                                 END4:   POPSP2                    ;POP 2 FROM STACK
```

```
                                      ;**********
                                      ;
                                      ;READ THE PAPER WIDTH, NUMBER OF COLUMNS,
                                      ;FROM SWITCH REGISTER POSITIONS 0-7. SAVE AND
                                      ;CONVERT TO 3 ASCII CHARACTERS. A WIDTH GT132
                                      ;OR LT30 COLUMNS (DECIMAL) WILL BE ABORTED TO 132.
                                      ;
                                      ;**********

001450  017701  177570                        MOV     @SR,R1          ;PUT (SR) INTO R1
001454  042701  177400                        BIC     #177400,R1      ;SAVE ONLY BITS 0-7
001460  020127  000204                        CMP     R1,#204         ;TEST NO. COLUMN GT132
001464  101003                                BHI     2$              ;COLUMNS GT132, DEFAULT TO 132
001466  020127  000035                1$:     CMP     R1,#35          ;CHECK IF NO. COLUMNS LT 30
001472  101002                                BHI     3$              ;NOT LT 30 NOR GT 132
001474  012701  000204                2$:     MOV     #204,R1         ;COLUMNS LT 30 OR GT 132, DEFAULT
001500  010137  001112                3$:     MOV     R1,WIDTH        ;SAVE NO. COLUMNS IN WIDTH
001504  012700  017045                        MOV     #HDRO,R0        ;ADDR TO STORE ASCII COLUMN VALUE
001510  012702  000003                        MOV     #3,R2           ;DO A 3 CHAR. CONVERSION
001514  104015                                BTOASC                  ;CONVERT NO. COLUMNS TO ASCII
001516  005037  001106                        CLR     RTNNO           ;SET ROUTINE NO = 0
001522  000401                        4$:     BR      5$              ;PRINT TITLE FIRST TIME
001524  000405                                BR      6$              ;SKIP IT AFTER FIRST TIME
001526  104002                        5$:     TYPEM                   ;PRINT DIAGNOSTIC HEADER
001530  016620                                STARTM
001532  012737  000240  001522                MOV     #NOP,4$         ;TAKE OUT BRANCH INSTR
001540  005737  001224                6$:     TST     IOSW            ;CHECK IF DJ11 OR DH11 UNDER TEST
001544  001440                                BEQ     10$             ;BRANCH IF DH11
001546  013701  001226                        MOV     DJCNT,R1        ;GET NUMBER OF DJ11'S
001552  012700  017004                        MOV     #DJ11S,R0       ;ADDR TO STOR ASCII CHAR
001556  012702  000002                        MOV     #2,R2           ;NO. OF ASCII CHARS (=2)
001562  104015                                BTOASC                  ;CONVERT TO ASCII
001564  104006                                CRLF
001566  104002                                TYPEM
001570  017004                                DJ11S                   ;OUTPUT MESSAGE
```

```
                                              ;********
                                              ;
                                              ; START ALL DJ11 RECEIVER SCANNERS
                                              ;
                                              ;********

 001572  012701  160010                          MOV     #160010,R1        ;ADDR OF FIRST DJ11 SCR
 001576  013703  001226                          MOV     DJCNT,R3          ;NO. OF DJ11 TO R3
 001602  001002                                  BNE     8$                ;BRANCH IF COUNT IS NOT ZERO
 001604  000000                          7$:     HALT
 001606  000776                                  BR      7$                ;DO NOT CONTINUE
 001610  052711  000010                  8$:     BIS     #10,(R1)          ;CLEAR MOS
 001614  012700  000005                  9$:     MOV     #5,R0             ;DELAY TIME TO R0
 001620  104003                                  DELAY
 001622  031127  000020                          BIT     (R1),#20          ;TEST IF CLEAR STILL BUSY
 001626  001372                                  BNE     9$                ;BRANCH IF BUSY
 001630  052711  000001                          BIS     #1,(R1)           ;START SCANNER
 001634  062701  000010                          ADD     #10,R1            ;ADDR OF NEXT SCR
 001640  005303                                  DEC     R3                ;DEC COUNT OF DJ11
 001642  001362                                  BNE     8$                ;NOT ZERO, START NEXT ONE
 001644  000412                                  BR      11$
 001646  013701  001230                  10$:    MOV     DHCNT,R1          ;NO. OF DH11'S TO R1
 001652  012700  016755                          MOV     #DH11S,R0         ;ADDR TO STORE ASCII CHAR
 001656  012702  000002                          MOV     #2,R2             ;NO. OF CHAR TO CONVERT
 001662  104015                                  BTOASC                    ;CONVERT TO ASCII
 001664  104006                                  CRLF
 001666  104002                                  TYPEM                     ;OUTPUT MESSAGE
 001670  016755                                  DH11S
 001672  032777  000400  177344          11$:    BIT     #BIT8,@SR         ;CKECK IF WANT TEST SELECTION?
 001700  001004                                  BNE     12$               ;BRANCH IF BIT 8 IS SET (YES)
 001702  012737  006410  001110                  MOV     #PT0,NXTST        ;STARTUP PRINTING TESTS
 001710  000430                                  BR      CHAINY
 001712  104002                          12$:    TYPEM                     ;TYPE SELECT TEST NO. MESSAGE
 001714  017257                                  MESG3
 001716  005037  001222                          CLR     ACTIV             ;SET TEST ACTIVE STATE NOT ACTIVE
 001722  005737  001224                          TST     IOSW              ;DH11 OR DJ11
 001726  001452                                  BEQ     TTY1A             ;WAIT FOR TERMINAL CONTROL FROM DH11
 001730  000435                                  BR      TTYJA             ;WAIT FOR TERMINAL CONTROL FROM DJ11



                                              ;**********
                                              ;
                                              ;CLEAN--INITIALIZES POINTERS BEFORE ENTERING A TEST
                                              ;
                                              ;**********

 001732  012737  000006  000004          $CLEAN: MOV     #6,MACHER         ;SET UP MACHINE ERROR VECTOR
 001740  005066  000002                          CLR     2(SP)             ;CLEAR PROCESSOR STATUS WORD
 001744  000002                                  RTI                       ;RETURN
```

```
                                        ;**********
                                        ;
                                        ;CHAINN--THIS PORTION IS THE COMMON RETURN
                                        ;       FOR ALL TESTS.
                                        ;
                                        ;**********

001746  032737  000001  001104  CHAINN: BIT     #1.CNTLSW       ;CKECK IF TERMINAL CONTROL
001754  001405                          BEQ     2$              ;BRANCH IF NOT
001756  005737  001224                  TST     IOSW            ;DH11 OR DJ11?
001762  001401                          BEQ     1$              ;BRANCH IF DH11
001764  104005                          TTYJTL                  ;WAIT FOR DJ11 TERMINAL CONTROL
001766  104004                  1$:     TTYCTL                  ;WAIT FOR DH11 TERMINAL CONTROL
001770  022626                  2$:     POPSP2                  ;CORRECT STACK

                                        ;**********
                                        ;
                                        ;       IF THE SR BIT 15 IS SET,THE CPU WILL HALT HERE WITH
                                        ;       THE TEST NUMBER IN R0. PRESS CONTINUE TO
                                        ;       RUN NEXT TEST
                                        ;
                                        ;**********

001772  005777  177246          CHAINY: TST     @SR             ;CHECK SW REG.
001776  100003                          BPL     1$              ;BRANCH IF NO HALT
002000  113700  001106                  MOVB    RTNNO,R0        ;CURRENT TEST NUMBER TO R0
002004  000000                          HALT
002006  104017                  1$:     CLEAN                   ;CLEAN UP
002010  012706  001100                  MOV     #SPBOT,SP       ;SET UP STACK POINTER
002014  104016                          FORWD                   ;SET UP VALUES FOR NEXT TEST
002016  000177  177076                  JMP     @CURTST         ;GO TO TEST


                                        ;**********
                                        ;
                                        ;TTYJ-- THIS ROUTINE IS USED WHEN THE DJ11S' ARE UNDER
                                        ;       TEST, OTHERWISE THE COMMENTS  AND INSTRUCTIONS ARE
                                        ;       THE SAME AS FOR TTY1.
                                        ;
                                        ;**********

002022  022626                  TTYJ:   POPSP2                  ;CORRECT STACK
002024  005737  001222          TTYJA:  TST     ACTIV           ;TEST IF ENTRY IS FROM A TEST
002030  001402                          BEQ     1$              ;BRANCH IF NOT
002032  000137  002410                  JMP     TTY1G
002036  004737  003016          1$:     JSR     PC.SCANDJ       ;LOOK FOR INPUT
002042  004737  003124                  JSR     PC.SETDJ        ;SET TERMINAL AS CONSOLE
002046  000137  002104                  JMP     TTY1B           ;GO TO CONTROL
```

```
                                ;**********
                                ;
                                ;TTY1-- THIS ROUTINE IS USED WHEN THE DH11'S ARE UNDER TEST. IT PROCESSES
                                ;       THE RESPONSE TO THE MESSAGE "SELECT TEST NO.". THE RESPONSE
                                ;       MUST BE THE TWO DIGIT OCTAL TEST NO. FOLLOWED BY:
                                ;               "L" TO LOOP ON TEST
                                ;               "S" TO SEQUENCE ON TEST
                                ;               "." TO EXECUTE TEST ONCE
                                ;       ALL SPACES ARE IGNORED AND AN ILLEGAL INPUT WILL BE FLAGED
                                ;       BY A "?" AND THE RETYPING OF THE ABOVE MESSAGE. THE FIRST
                                ;       TERMINAL TO RESPOND IS THE TERMINAL UNDER TEST. ALL
                                ;       PRINTER TESTS WILL OUTPUT TO ALL TERMINALS IF SR BIT 13 IS = 1
                                ;       WHILE THE ECHO TESTS WILL RESPOND TO THE PRINTER UNDER TEST ONLY.
                                ;
                                ;**********

002052  022626                  TTY1:   POPSP2                  ;CORRECT STACK
002054  005737  001230          TTY1A:  TST     DHCNT           ;BE SURE THAT THERE ARE DH11'S
002060  001002                          BNE     2$              ;BRANCH IF YES
002062  000000                  1$:     HALT
002064  000776                          BR      1$              ;DO NOT CONTINUE
002066  005737  001222          2$:     TST     ACTIV           ;TEST IF ENTRY IS FROM A TEST
002072  001146                          BNE     TTY1G           ;BRANCH IF IT IS
002074  004737  002604                  JSR     PC,SCANDH       ;LOOK FOR INPUT
002100  004737  002660                  JSR     PC,SETERM       ;SET TERMINAL DATA
002104  042700  177600          TTY1B:  BIC     #177600,R0      ;SAVE ONLY CHAR
002110  010037  001124                  MOV     R0,TEMPCH       ;GET CHAR
002114  020027  000040          1$:     CMP     R0,#40          ;CHECK IF CHAR IS A SPACE
002120  001002                          BNE     2$              ;BRANCH IF NOT
002122  104013                          READ                    ;SPACE, LOOP WAITING FOR NEXT CHAR
002124  000773                          BR      1$              ;GOT ONE
002126  012700  000036          2$:     MOV     #30.,R0         ;DELAY FOR HALF DUPLEX
002132  104003                          DELAY
002134  013700  001124                  MOV     TEMPCH,R0       ;GET CHAR
002140  104021                          ECHO                    ;ECHO CHAR
002142  104020                          TESTC                   ;GO TEST CHAR
002144  000421                          BR      11$             ;ERROR IN CHAR
002146  010005                          MOV     R0,R5           ;OK, SAVE DIGIT IN R5, POS 5-3
002150  006305                          ASL     R5
002152  006305                          ASL     R5
002154  006305                          ASL     R5
002156  104013                          READ                    ;GO WAIT FOR NEXT CHAR
002160  020027  000040          3$:     CMP     R0,#40          ;CHECK IF A SPACE
002164  001002                          BNE     4$              ;BRANCH IF NOT A SPACE
002166  104013                          READ                    ;WAIT FOR CHAR
002170  000773                          BR      3$              ;GOT ONE, ECHO IT
002172  012700  000036          4$:     MOV     #30.,R0         ;DELAY FOR HALF DUPLEX
002176  104003                          DELAY
002200  013700  001124                  MOV     TEMPCH,R0       ;GET CHAR
002204  104021                          ECHO                    ;ECHO CHAR
002206  104020                          TESTC                   ;GO CHECK CHAR
002210  000555                  11$:    BR      NG              ;ERROR IN CHAR
002212  060005                          ADD     R0,R5           ;OK,R5 IS NOW OCTAL TEST NO.
002214  104013                          READ                    ;GO WAIT FOR TERMINATOR
```

```
002216  020027  000040          5$:     CMP     R0,#40          ;CHECK IF A SPACE
002222  001002                          BNE     6$              ;BRANCH IF NOT A SPACE
002224  104013                          READ                    ;SPACE,WAIT SOME MORE
002226  000773                          BR      5$              ;GOT ONE , ECHO IT
002230  012700  000036          6$:     MOV     #30.,R0         ;DELAY FOR HALF DUPLEX
002234  104003                          DELAY
002236  013700  001124                  MOV     TEMPCH,R0       ;GET CHAR
002242  104021                          ECHO                    ;ECHO CHAR
002244  042700  000040                  BIC     #BITS,R0        ;ALLOW LOWER CASE OR UPPER CASE
002250  020027  000114                  CMP     R0,#114         ;IS IT AN "L"
002254  001413                          BEQ     7$              ;BRANCH IF YES
002256  020027  000123                  CMP     R0,#123         ;NO, IS IT AN "S"
002262  001414                          BEQ     8$              ;BRANCH IF YES
002264  023727  001124  000056          CMP     TEMPCH,#56      ;NO, IS IT A "."
002272  001124                          BNE     NG              ;NO, ERROROR
002274  012737  000001  001104          MOV     #1,CNTLSW       ;SET BIT 0 ONLY IN CNTLSW
002302  000407                          BR      9$
002304  012737  004001  001104  7$:     MOV     #4001,CNTLSW    ;SET BITS 11 AND 0
002312  000403                          BR      9$
002314  012737  000401  001104  8$:     MOV     #401,CNTLSW     ;SET BITS 8 AND 0
002322  104017                  9$:     CLEAN                   ;CLEAN UP
002324  012706  001100                  MOV     #SPBOT,SP       ;RESET SP
002330  010500                          MOV     R5,R0           ;TEST NO TO R0
002332  020027  000040                  CMP     R0,#40          ;CHECK IF TEST NO. IS EQ OR GT 40
002336  103102                          BHIS    NG              ;ERROR IF YES
002340  020027  000020                  CMP     R0,#20          ;CHECK IF THIS IS AN ECHO TEST
002344  103406                          BLO     10$             ;BRANCH IF NOT
002346  020027  000030                  CMP     R0,#30          ;OPTION TEST?
002352  103003                          BHIS    10$             ;ALLOW LOOP ON OPTION TEST
002354  012737  000001  001104          MOV     #1,CNTLSW       ;YES, FORCE TO ONE TIME ONLY
002362  006300                  10$:    ASL     R0              ;TEST NO. * 2
002364  016037  003156  001110          MOV     PRGTAB(R0),NXTST;ADDR OF TEST TO NXTST
002372  001464                          BEQ     NG              ;BRANCH IF ILLEGAL TEST
002374  104016                          FORWD                   ;SET UP TEST PARAMETERS
002376  012737  000001  001222          MOV     #1,ACTIV        ;SET TEST ACTIVE IND
002404  000177  176510                  JMP     @CURTST         ;GO TO TEST
002410  017700  176524          TTY1G:  MOV     @NRCRA,R0       ;TEST ACTIVE,CHECK INPUT FROM DH11
002414  100040                          BPL     TTY1L           ;BRANCH IF NO DATA
002416  010004                          MOV     R0,R4           ;DATA, SAVE IT
002420  000300                          SWAB    R0              ;RIGHT JUSTIFY LINE NO.
002422  042700  177760                  BIC     #177760,R0      ;CLEAR ALL BUT LINE NO.
002426  020037  001156                  CMP     R0,LINENO       ;CHECK IF LINE NO. IS SAME AS TEST LINE
002432  001366                          BNE     TTY1G           ;NOT SAME, SEE IF ANY MORE IN SILO
002434  010400                          MOV     R4,R0           ;LINES ARE THE SAME, GET CHAR
002436  042700  177600                  BIC     #177600,R0      ;SAVE 7 BITS OF CHAR
002442  020027  000177                  CMP     R0,#177         ;CHECK IF A RUBOUT
002446  001360                          BNE     TTY1G           ;NOT A RUBOUT, SEE IF ANY MORE
002450  012706  001100          TTY1H:  MOV     #SPBOT,SP       ;RESET STACK
002454  012737  000001  001104          MOV     #1,CNTLSW       ;CLEAR BITS 11 AND 8
002462  012700  000036                  MOV     #30.,R0         ;DELAY FOR HALF DUPLEX
002466  104003                          DELAY
002470  104002                          TYPEM                   ;OUTPUT MESSAGE
002472  017257                          MESG3
002474  005037  001222                  CLR     ACTIV           ;CLEAR TEST ACTIVE STATE
```

```
002500  005737  001224                          TST     IOSW            ;DJ11 OR DH11 ?
002504  001402                                  BEQ     1$              ;BRANCH IF DH11
002506  000137  002024                          JMP     TTYJA           ;WAIT FOR NEXT TEST FROM DJ11
002512  000137  002054                  1$:     JMP     TTY1A           ;WAIT FOR NEXT TEST FROM DH11
002516  032737  004000  001104  TTY1L:  BIT     #BIT11,CNTLSW   ;CHECK IF LOOP ON TEST
002524  001401                                  BEQ     1$              ;BRANCH IF NO LOOP
002526  000002                                  RTI                     ;GO LOOP ON TEST
002530  032737  000400  001104  1$:     BIT     #BIT8,CNTLSW    ;CHECK IF LOOP ON SEQUENCE
002536  001744                                  BEQ     TTY1H           ;BRANCH IF NO
002540  000137  001772                          JMP     CHAINY          ;GO LOOP ON SEQUENCE
002544  012700  000036                  NG:     MOV     #30.,R0         ;DELAY FOR HALF DUPLEX
002550  104003                                  DELAY
002552  112700  000077                          MOVB    #77,R0          ;"?" TO TEMPCH
002556  104021                                  ECHO                    ;PRINT A ?
002560  000733                                  BR      TTY1H           ;TRY AGAIN FROM DH11


                                        ;**********
                                        ;
                                        ;FORWARD--THIS ROUTINE TRANSFERS THE 2 ARGUMENTS
                                        ;               FROM THE TEST ROUTINE. THEY ARE;
                                        ;               1- ROUTINE NUMBER
                                        ;               2- ADDRESS OF NEXT TEST
                                        ;
                                        ;**********

002562  013705  001110                  $FORWD: MOV     NXTST,R5        ;ADDR OF NEXT TEST TO R5
002566  012537  001106                          MOV     (R5)+,RTNNO     ;GET NUMBER OF NEXT TEST
002572  012537  001110                          MOV     (R5)+,NXTST     ;GET ADDR OF FOLLOWING TEST
002576  010537  001120                          MOV     R5,CURTST       ;ENTRY POINT TO TEST IN CURTST
002602  000002                                  RTI                     ;EXIT


                                        ;**********
                                        ;
                                        ;SCANDH - ROUTINE TO SCAN DH CHANNELS LOOKING FOR INPUT
                                        ;
                                        ;**********

002604  013701  001230                  SCANDH: MOV     DHCNT,R1        ;COUNT OF DH11'S TO R1
002610  005037  001154                          CLR     CNTDH           ;CLEAR DH11 POSITION COUNTER
002614  013700  001134                          MOV     DHADR,R0        ;ADDR OF FIRST DH11 TO R0
002620  005720                                  TST     (R0)+           ;ADDR OF NRCRA
002622  010037  001140                          MOV     R0,NRCRA        ;SET UP NRCRA ADDRESS
002626  017700  176306                  1$:     MOV     @NRCRA,R0       ;GET NEXT CHAR FROM SILO
002632  100410                                  BMI     2$              ;BRANCH IF DATA IS PRESENT
002634  005301                                  DEC     R1              ;DECREMENT COUNT OF DH11'S
002636  001762                                  BEQ     SCANDH          ;START OVER IF ALL DONE
002640  062737  000020  001140                  ADD     #20,NRCRA       ;SET UP ADDR FOR NEXT DH11
002646  005237  001154                          INC     CNTDH           ;INC DH11 POSITION COUNTER
002652  000765                                  BR      1$              ;GO CHECK NEXT DH11 ON BUS
002654  010004                          2$:     MOV     R0,R4           ;SAVE LINE NO. AND CHAR
002656  000207                                  RTS     PC              ;RETURN
```

B04

```
                                       ;***********
                                       ;
                                       ;SETERM - THIS ROUTINE IS USED TO SET UP THE REGISTER ADDRESSES OF
                                       ;         THE TERMINAL CURRENTLY UNDER TEST.
                                       ;
                                       ;***********

        002660  013701  001140         SETERM: MOV     NRCRA,R1                ;GET ADDR OF CURRENT NRCRA
        002664  005741                         TST     -(R1)                   ;CAL ADDR OF SCR
        002666  010137  001136                 MOV     R1,SCR                  ;STORE SCR ADDR
        002672  022121                         CMP     (R1)+,(R1)+             ;ADD 4
        002674  010137  001142                 MOV     R1,LPR                  ;STORE LPR ADDR
        002700  005721                         TST     (R1)+                   ;ADD 2
        002702  010137  001144                 MOV     R1,CARA                 ;STORE CARA ADDR
        002706  005721                         TST     (R1)+                   ;ADD 2
        002710  010137  001146                 MOV     R1,BYCR                 ;STORE BYCR ADDR
        002714  005721                         TST     (R1)+                   ;ADD 2
        002716  010137  001150                 MOV     R1,BAR                  ;STORE BAR ADDR
        002722  022121                         CMP     (R1)+,(R1)+             ;ADD 4
        002724  010137  001152                 MOV     R1,SSR                  ;STORE SSR ADDR
        002730  000300                         SWAB    R0                      ;RIGHT JUSTIFY LINE NO.
        002732  042700  177760                 BIC     #177760,R0              ;SAVE ONLY LINE NO.
        002736  010077  176174                 MOV     R0,@SCR                 ;SET UP SCR
        002742  012701  015560                 MOV     #DH1100,R1              ;GET ADDR OF VP TABLE
        002746  005737  001154         1$:     TST     CNTDH                   ;CAL WHICH DH11 IS UNDER TEST
        002752  001405                         BEQ     2$                      ;BRANCH IF THIS IS THE ONE
        002754  062701  000020                 ADD     #20,R1                  ;REPOSITION R1 IN VP TABLE
        002760  005337  001154                 DEC     CNTDH                   ;DEC DH11 POSITION COUNTER
        002764  000773                         BR      1$
        002766  010037  001156         2$:     MOV     R0,LINENO               ;SAVE LINE NO.
        002772  006300                         ASL     R0                      ;CREATE POINTER TO TABLE
        002774  060001                         ADD     R0,R1                   ;ADD LINE NO. TO VP TAB PNTR
        002776  011177  176140                 MOV     (R1),@LPR               ;PUT VP INTO LPR
        003002  062700  001162                 ADD     #BITTAB,R0              ;CAL PNTR INTO LINE MASK TABLE
        003006  011037  001160                 MOV     (R0),MASK               ;PUT LINE MASK INTO MASK
        003012  010400                         MOV     R4,R0                   ;RESTORE LINE NO AND CHAR
        003014  000207                         RTS     PC                      ;RETURN
```

```
                                        ;**********
                                        ;
                                        ;SCANDJ - ROUTINE TO SCAN CHANNELS LOOKING FOR INPUT
                                        ;
                                        ;*********

        003016  013701  001226          SCANDJ: MOV     DJCNT,R1                ;COUNT OF DJ11 TO R1
        003022  005037  001154                  CLR     CNTCH                   ;CLEAR POS. COUNTER
        003026  012700  160012                  MOV     #160012,R0              ;ADDR OF FIRST RECV BUFFER TO R0
        003032  012703  016560                  MOV     #ELTAB,R3               ;ADDR OF ELTAB TO R3
        003036  011002                  1$:     MOV     (R0),R2                 ;GET RECV BUFFER
        003040  100410                          BMI     3$                      ;BRANCH IF DATA
        003042  005301                  2$:     DEC     R1                      ;NO DATA, DEC COUNT OF DJ11
        003044  001764                          BEQ     SCANDJ                  ;START OVER IF ALL CHECKED
        003046  062700  000010                  ADD     #10,R0                  ;ADDR OF NEXT RBUF
        003052  005723                          TST     (R3)+                   ;INCREMENT ELTAB POINTER
        003054  005237  001154                  INC     CNTCH                   ;INCREMENT POS COUNTER
        003060  000766                          BR      1$                      ;DO NEXT DJ11
        003062  010204                  3$:     MOV     R2,R4                   ;GET CONTENTS OF RBUF
        003064  000302                          SWAB    R2
        003066  042702  177760                  BIC     #177760,R2              ;SAVE ONLY THE LINE NO.
        003072  010237  001156                  MOV     R2,LINENO               ;SAVE LINE NO.
        003076  006302                          ASL     R2                      ;LINE NO.*2
        003100  062702  001162                  ADD     #BITTAB,R2              ;CAL ADDR OF LINE MASK
        003104  011237  001160                  MOV     (R2),MASK               ;SAVE LINE MASK
        003110  036713  001160                  BIT     MASK,(R3)               ;CHECK IF LINE EXISTS
        003114  001352                          BNE     2$                      ;BRANCH IF NOT
        003116  110402                          MOVB    R4,R2                   ;RESTORE R2 WITH CHAR
        003120  001750                          BEQ     2$                      ;BRANCH IF NULL
        003122  000207                          RTS     PC                      ;RETURN


                                        ;**********
                                        ;
                                        ;SETDJ - THIS ROUTINE IS USED TO SET UP THE PARAMETERS
                                        ;        FOR THE DJ11 TERMINAL CURRENTLY UNDER TEST.
                                        ;
                                        ;**********

        003124  010037  001140          SETDJ:  MOV     R0,NRIRA                ;SAVE ADDR FOR READ & TTYIN
        003130  005740                          TST     -(R0)                   ;CAL ADDR OF CSR
        003132  010037  001236                  MOV     R0,CSR                  ;ADDR OF CURRENT CSR
        003136  022020                          CMP     (R0)+,(R0)+             ;CAL ADDR OF TCR
        003140  010037  001240                  MOV     R0,TCR                  ;SAVE ADDR OF CURRENT CSR
        003144  005720                          TST     (R0)+                   ;CAL ADDR OF TBUF
        003146  010037  001242                  MOV     R0,TBUF                 ;SAVE ADDR OF CURRENT TBUF
        003152  010400                          MOV     R4,R0                   ;GET CONTENTS OF RECV BUFFER AGAIN
        003154  000207                          RTS     PC                      ;RETURN
```

D04

```
628
629                                                  .SBTTL  TEST ADDRESS TABLE
630     003156  006410                      PRGTAB: PT0                           ;DATA PATH TEST
631     003160  006464                              PT1                           ;PRINTER CHARACTER TEST
632     003162  006626                              PT2                           ;NON-PRINTING CHARACTER TEST
633     003164  007236                              PT3                           ;CARRIAGE RETURN TEST
634     003166  007350                              PT4                           ;MULTIPLE LINE FEED TEST
635     003170  007536                              PT5                           ;SINGLE LINE FEED TEST
636     003172  007740                              PT6                           ;BACKSPACE TEST
637     003174  010132                              PT7                           ;OVERPRINT TEST
638     003176  010334                              PT10                          ;PRINTING FREQUENCY SWEEP TEST
639     003200  010472                              PT11                          ;RIBBON FEED TEST
640     003202  010524                              PT12                          ;PRINTER BELL TEST
641     003204  000000                              OPEN                          ;SPARE FOR ADDITIONAL PRINTER TEST
642     003206  000000                              OPEN                          ;SPARE FOR ADDITIONAL PRINTER TEST
643     003210  000000                              OPEN                          ;SPARE FOR ADDITIONAL PRINTER TEST
644     003212  000000                              OPEN                          ;SPARE FOR ADDITIONAL PRINTER TEST
645     003214  010614                              PT17                          ;LIFE TEST
646
647     003216  010756                              EC00                          ;CHARACTER ECHO TEST
648     003220  011020                              EC01                          ;LINE ECHO TEST, FAST RATE
649     003222  011074                              EC02                          ;LINE ECHO TEST, SLOW RATE
650     003224  011362                              EC03                          ;CHARACTER/CODE ECHO TEST
651     003226  011700                              EC04                          ;SELECTIVE PATTERN ECHO TEST
652     003230  012466                              EC05                          ;BELL ECHO TEST
653     003232  000000                              OPEN                          ;SPARE FOR ADDITIONAL ECHO TESTS
654     003234  000000                              OPEN                          ;SPARE FOR ADDITIONAL ECHO TESTS
655
656     003236  012570                              TEST30                        ;SECONDARY CHARACTER SET OPTION
657     003240  012750                              TEST31                        ;SELECTIVE ADDRESSING OPTION
658     003242  013530                              TEST32                        ;AUTO ANSWER BACK OPTION
659     003244  014240                              TEST33                        ;FORM FEED OPTION
660     003246  014400                              TEST34                        ;HORIZONTAL TAB OPTION
661     003250  015146                              TEST35                        ;VERTICAL TAB OPTION
662     003252  000000                              OPEN                          ;SPARE FOR ADDITIONAL OPTION TESTS
663     003254  000000                              OPEN                          ;SPARE FOR ADDITIONAL OPTION TESTS
```

```
                                              .SBTTL  EMT TRAP DECODER


                                       ;***********
                                       ;
                                       ;EMTINT--SERVICE ROUTINES FOR TRAPS THROUGH LOC. 30 AND 34.
                                       ;
                                       ;***********

        003256  011646                 EMTINT: MOV     @SP,-(SP)               ;GET SAVED PC
        003260  162716  000002                 SUB     #2,@SP                  ;DECREMENT PC BY TWO
        003264  017616  000000                 MOV     @(SP),@SP
        003270  121627  000022                 CMPB    @SP,#22                 ;CHECK THAT CALL IS WITHIN LIMITS
        003274  101402                         BLOS    2$                      ;BRANCH IF OK
        003276  000000                 1$:     HALT
        003300  000776                         BR      1$
        003302  006116                 2$:     ROL     @SP                     ;EMT ARGUMENT *2
        003304  042716  177001                 BIC     #177001,@SP             ;REMOVE 7 MSB
        003310  062716  003332                 ADD     #EMTTAB,@SP             ;FORM EMT RTN ADDRESS
        003314  017616  000000                 MOV     @(SP),@SP
        003320  005046                         CLR     -(SP)                   ;CLEAR PSW
        003322  012746  003330                 MOV     #3$,-(SP)
        003326  000002                         RTI
        003330  000136                 3$:     JMP     @(SP)+                  ;GO TO EMT ROUTINE

        003332  003776                 EMTTAB: TYP                             ;MESSAGE OUTPUT ROUTINE
        003334  001746                         CHAINN                          ;COMMON TEST EXIT
        003336  004036                         TYPM                            ;MESSAGE OUTPUT ROUTINE, MULTI DEVICES
        003340  004056                         DLY                             ;DELAY ROUTINE
        003342  002050                         TTY1                            ;DH11 CONSOLE TERMINAL CONTROL
        003344  002020                         TTYJ                            ;DJ11 CONSOLE TERMINAL CONTROL
        003346  004356                         $CRLF                           ;CARRIAGE RETURN, ALL TERMINALS
        003350  004340                         $SCRLF                          ;CARRIAGE RETURN, CONSOLE TERMINAL
        003352  004360                         $LF                             ;LINE FEED ONLY, ALL TERM'S
        003354  004454                         $PRTC                           ;PRINT CHAR, ALL TERM'S
        003356  004400                         $PRHDR                          ;PRINT TEST HEADER
        003360  003600                         $READ                           ;READ CHAR
        003362  004370                         $CR                             ;CARRIAGE RETURN ONLY, ALL TERM'S
        003364  004200                         $BTASC                          ;BINARY TO ASCII CONVERSION
        003366  002560                         $FORWD
        003370  001730                         $CLEAN
        003372  004300                         $TESTC                          ;CHECK CHAR
        003374  003400                         $ECHO                           ;PRINT CHAR, CONSOLE ONLY
        003376  003530                         $INRDY                          ;CHECK IF READY
```

F04

```
                                        .SBTTL  COMMON ROUTINES

                                ;**********
                                ;
                                ;ECHO-- THIS ROUTINE ECHOS CHARACTERS ON THE TERMINAL UNDER TEST.
                                ;
                                ;**********

 003400  005737  001224         $ECHO:  TST     ICSW                    ;DJ11 OR DH11
 003404  001026                         BNE     ECHODJ                  ;BRANCH IF DJ11
 003406  037737  175536  001160         BIT     @BAR,MASK               ;CHECK IF OK TO SEND TO DH11
 003414  001371                         BNE     $ECHO                   ;NO,WAIT UNTIL OK
 003416  010037  001124                 MOV     R0,TEMPCH               ;CHAR INTO TEMPCH
 003422  013777  001156  175506         MOV     LINENO,@SCR             ;SET LINE NUMBER
 003430  012777  001124  175506         MOV     #TEMPCH,@CARA           ;OK,PUT ADDR OF CHAR INTO CARA
 003436  012777  177777  175502         MOV     #-1,@BYCR               ;SET CHAR COUNT TO 1
 003444  012777  000020  175500         MOV     #20,@SSR                ;SET SILO OVERFLOW TO 16
 003452  053777  001160  175470         BIS     MASK,@BAR               ;SET TRANSMIT BIT
 003460  000002                         RTI                             ;RETURN
 003462  013777  001160  175550 ECHODJ: MOV     MASK,@TCR               ;SET LINE NO. IN TCR
 003470  052777  000400  175540 1$:     BIS     #BIT8,@CSR              ;START TRANSMITTER SCANNER
 003476  005777  175534         2$:     TST     @CSR                    ;CHECK IF OK
 003502  100375                         BPL     2$                      ;BRANCH IF NOT READY
 003504  017704  175532                 MOV     @TBUF,R4                ;GET CONTENTS OF TBUF
 003510  000304                         SWAB    R4                      ;RIGHT JUSTIFY LINE NO.
 003512  042704  177760                 BIC     #177760,R4              ;SAVE ONLY THE LINE NO.
 003516  020437  001156                 CMP     R4,LINENO               ;BE SURE IT'S THE LINE UNDER TEST
 003522  001362                         BNE     1$                      ;BRANCH IF NOT
 003524  110077  175512                 MOVB    R0,@TBUF                ;LOAD CHAR TO PRINT
 003530  110037  001124                 MOVB    R0,TEMPCH               ;SAVE CHAR IN TEMPCH
 003534  000002                         RTI                             ;RETURN

                                ;**********
                                ;
                                ;INRDY-- CHECKS IF ANY INPUT FROM TERMINAL UNDER TEST.
                                ;        RETURN VIA PC IF NO CHAR OR VIA PC+2 IF VALID CHAR.  CHAR WILL
                                ;        BE IN BITS 6-0 OF TEMPCH.
                                ;        CALLING SEQUENCE:
                                ;          INRDY
                                ;          NO CHAR RETURN
                                ;          VALID CHAR RETURN
                                ;
                                ;
                                ;**********

 003536  017700  175376         $INRDY: MOV     @NRCRA,R0               ;GET CHAR
 003542  100015                         BPL     1$                      ;BRANCH IF NO CHAR
 003544  010037  001124                 MOV     R0,TEMPCH               ;SAVE CHAR
 003550  000300                         SWAB    R0                      ;RIGHT JUSTIFY LINE NO.
 003552  042700  177760                 BIC     #177760,R0              ;SAVE ONLY LINE NO.
 003556  020037  001156                 CMP     R0,LINENO               ;CHECK IF SAME AS LINE UNDER TEST
 003562  001365                         BNE     $INRDY                  ;BRANCH IF NOT LINE UNDER TEST
 003564  042737  177600  001124         BIC     #177600,TEMPCH          ;SAVE ONLY THE CHAR
 003572  062716  000002                 ADD     #2,@SP                  ;SET UP RETURN ADDR.
 003576  000002                 1$:     RTI                             ;RETURN
```

```
                                        ;***********
                                        ;
                                        ;READ-- THIS ROUTINE READS INPUT FROM THE TERMINAL UNDER TEST ONLY
                                        ;       IF SW13 IS SET. OTHERWISE ALL TERMINALS ARE SCANNED FOR INPUT
                                        ;       AND TERMINAL WHERE CHARACTER IS RECEIVED IS SET AS THE
                                        ;       TERMINAL UNDER TEST.
                                        ;
                                        ;***********
003600  032777  020000  175436  $READ:  BIT     #BIT13,@SR              ;SW13 SET?
003606  001413                          BEQ     1$                      ;BRANCH IF NOT
003610  017700  175324                  MOV     @NRCRA,R0               ;GET CHAR
003614  100371                          BPL     $READ                   ;NO CHAR, WAIT FOR ONE
003616  010004                          MOV     R0,R4                   ;VALID DATA
003620  000304                          SWAB    R4                      ;RIGHT JUSTIFY LINE NO.
003622  042704  177760                  BIC     #177760,R4              ;SAVE ONLY LINE NO.
003626  020437  001156                  CMP     R4,LINENO               ;CHECK IF SAME AS LINE UNDER TEST
003632  001362                          BNE     $READ                   ;BRANCH IF NOT
003634  000424                          BR      4$                      ;CONTINUE
003636  010146                  1$:     MOV     R1,-(SP)                ;SAVE R1
003640  010246                          MOV     R2,-(SP)
003642  010346                          MOV     R3,-(SP)
003644  010446                          MOV     R4,-(SP)
003646  005737  001224                  TST     IOSW                    ;DH OR DJ?
003652  001005                          BNE     2$                      ;BRANCH IF DJ
003654  004737  002604                  JSR     PC,SCANDH               ;LOOK FOR INPUT
003660  004737  002660                  JSR     PC,SETERM               ;SETUP TERMINAL UNDER TEST
003664  000404                          BR      3$                      ;CONTINUE
003666  004737  003016          2$:     JSR     PC,SCANDJ               ;LOOK FOR DJ INPUT
003672  004737  003124                  JSR     PC,SETDJ                ;SETUP DJ UNDER TEST
003676  012604                  3$:     MOV     (SP)+,R4                ;RESTORE REGS
003700  012603                          MOV     (SP)+,R3
003702  012602                          MOV     (SP)+,R2
003704  012601                          MOV     (SP)+,R1
003706  010037  001130          4$:     MOV     R0,PCHAR                ;SAVE CHAR WITH PARITY BIT
003712  113737  001130  001127          MOVB    PCHAR,PARITY+1          ;GET CODE FOR PARITY CHECK
003720  042737  177400  001130          BIC     #177400,PCHAR           ;CLEAR UNWANTED BITS
003726  042700  177600                  BIC     #177600,R0              ;SAVE ONLY THE CHAR
003732  010037  001124                  MOV     R0,TEMPCH
003736  012700  000011                  MOV     #11,R0                  ;SET SHIFT COUNT
003742  042737  000377  001126          BIC     #377,PARITY             ;CLEAR PARITY FLAG
003750  005300                  5$:     DEC     R0                      ;DECREMENT SHIFT COUNT
003752  001406                          BEQ     6$                      ;EXIT IF DONE
003754  106337  001127                  ASLB    PARITY+1                ;ROTATE CODE
003760  103373                          BCC     5$                      ;CONTINUE IF CARRY BIT WAS A ZERO
003762  105137  001126                  COMB    PARITY                  ;COMPLIMENT PARITY FLAG IF BIT WAS ONE
003766  000770                          BR      5$                      ;CONTINUE
003770  013700  001124          6$:     MOV     TEMPCH,R0               ;RESTORE R0
003774  000002                          RTI                             ;RETURN
```

```
                                  ;XXXXXXXXXX
                                  ;
                                  ;TYPE-- A COMMON ROUTINE USED TO TYPE MESSAGES ON THE TERMINAL
                                  ;       UNCER TEST ONLY.  THE NULL CHARACTER TERMINATES
                                  ;       THE MESSAGE. CALLED THROUGH AN EMT TRAP.
                                  ;       CALLING SEQUENCE
                                  ;       TYPE
                                  ;       MESG     ;ADDRESS OF MESSAGE
                                  ;
                                  ;XXXXXXXXXX

 003776  011601                   TYP:    MOV     @SP,R1          ;GET POINTER TO ADDR. OF MESG.
 004000  062716  000002                   ADD     #2,@SP          ;SET UP RETURN ADDRESS
 004004  011101                           MOV     @R1,R1          ;ADDR. OF MESG TO R1
 004006  112100                   1$:     MOVB    (R1)+,R0        ;GET CHAR
 004010  100402                           BMI     2$              ;BRANCH IF WANT AUTO CR-LF
 004012  001003                           BNE     3$              ;PRINT CHAR IF NOT NULL
 004014  000002                           RTI                     ;EXIT ON NULL CHAR
 004016  104007                   2$:     SCRLF                   ;SEND A CRLF
 004020  000772                           BR      1$              ;GET NEXT CHAR
 004022  104021                   3$:     ECHO                    ;OUTPUT CHAR
 004024  000770                           BR      1$              ;GO GET NEXT CHAR

                                  ;XXXXXXXXXX
                                  ;
                                  ;TYPM---MULTI TYPE-A COMMON ROUTINE TO OUTPUT
                                  ;       A MESSAGE ON ALL DH11S.
                                  ;       THIS ROUTINE IS USED BY
                                  ;       THE PRINTER TESTS TO TYPE HEADINGS.
                                  ;       CALLING SEQUENCE:
                                  ;         TYPEM
                                  ;         MESGAD          ;ADDRESS OF MESSAGE
                                  ;
                                  ;XXXXXXXXXX

 004026  011601                   TYPM:   MOV     @SP,R1          ;GET POINTER TO ADDR OF MESG
 004030  062716  000002                   ADD     #2,@SP          ;SET UP RETURN ADDRESS
 004034  011101                           MOV     @R1,R1          ;ADDR OF MESG TO R1
 004036  112100                   1$:     MOVB    (R1)+,R0        ;GET CHAR
 004040  100402                           BMI     2$              ;BRANCH IF WANT AUTO CR-LF
 004042  001003                           BNE     3$              ;CONTINUE IF NOT NULL
 004044  000002                           RTI                     ;RETURN TO CALLER
 004046  104006                   2$:     CRLF                    ;SEND CR-LF
 004050  000772                           BR      1$              ;GET NEXT CHAR
 004052  104011                   3$:     PRINTC                  ;PRINT CHAR
 004054  000770                           BR      1$              ;GO GET NEXT CHAR.
```

```
                                    ;**********
                                    ;
                                    ;DELAY--A COMMON ROUTINE TO DELAY PROCESSING
                                    ;       A GIVEN NUMBER OF MSEC.
                                    ;       CALLING SEQUENCE:
                                    ;       MOV   #5,R0   ;R0 CONTAINS THE NUMBER OF MSEC DELA. DESIRED
                                    ;       DELAY
                                    ;
                                    ;       THE DELAY IS EFFECTED BY THE EXECUTION OF THE LOOP:
                                    ;          1$:  DEC  R1
                                    ;               BNE  1$
                                    ;
                                    ;       SINCE THE EXECUTION TIMES OF THE PDP11 LINE DOES VARY FROM
                                    ;       MACHINE TO MACHINE, THE VALUE AT SYMBOLIC LOCATION
                                    ;       "TIMER" MUST BE CHANGED TO THE APPROPRIATE VALUE AS SHOWN BELOW
                                    ;       BEFORE STARTING THE DIAGNOSTIC. "TIMER" IS INITIALIZED
                                    ;        FOR AN PDP-11/40 (TIMER = 554).
                                    ;
                                    ;MACHINE        05&10   35&40   15&20                     11/45 & 11/70
                                    ;                                               BIPOLAR       MOS      CORE
                                    ;LOOP: DEC R1   3.4     .99     2.3              .30           .51      .90
                                    ;      BNE LOOP 2.5     1.76    2.6              .60           .98     1.13
                                    ;  TIME=        5.9US   2.75    4.9             .90USEC       1.49USEC         2.03USEC
                                    ; SET TIMER     251     554     314             2127          1237     755
                                    ;
                                    ;XXXXXXXXXXX




     004056  010146                 DLY:    MOV     R1,-(SP)        ;SAVE R1
     004060  013701  001102         1$:     MOV     TIMER,R1        ;MOV 1MSEC LOOP CNT TO R1
     004064  005301                 2$:     DEC     R1              ;DECREMENT COUNT
     004066  001376                         BNE     2$              ;BRANCH IF NOT ZERO
     004070  005300                         DEC     R0              ;DEC NO. OF MSEC DELAY
     004072  001372                         BNE     1$              ;DELAY AGAIN IF NOT ZERO
     004074  012601                         MOV     (SP)+,R1        ;ALL DONE RESTORE R1
     004076  000002                         RTI
```

```
                                        ;**********
                                        ;
                                        ;PFAIL--POWER FAIL ROUTINE
                                        ;       SAVE ALL REGISTERS AND SET RESTART ADDRESS
                                        ;       INTO LOCATION 24
                                        ;
                                        ;RESTART--POWER FAIL RECOVERY
                                        ;        RESTORE ALL REGISTERS AND GO TO START
                                        ;
                                        ;**********

004100  010046                          PFAIL:  MOV     R0,-(SP)
004102  010146                                  MOV     R1,-(SP)
004104  010246                                  MOV     R2,-(SP)
004106  010346                                  MOV     R3,-(SP)
004110  010446                                  MOV     R4,-(SP)
004112  010546                                  MOV     R5,-(SP)
004114  013746  000024                          MOV     24,-(SP)
004120  010637  004134                          MOV     SP,SAVR6        ;SAVE STACK POSITION
004124  012737  004136  000024                  MOV     #RESTRT,24      ;STORE RESTART ADDRESS
004132  000000                                  HALT

004134  000000                          SAVR6:  .WORD   0

004136  104002                          RESTRT: TYPEM                   ;TYPE POWER MESG
004140  004172                                  1$
004142  013706  004134                          MOV     SAVR6,SP        ;RESTORE STACK POINTER
004146  012637  000024                          MOV     (SP)+,24        ;RESTORE PFAIL ADDRESS
004152  012605                                  MOV     (SP)+,R5
004154  012604                                  MOV     (SP)+,R4
004156  012603                                  MOV     (SP)+,R3
004160  012602                                  MOV     (SP)+,R2
004162  012601                                  MOV     (SP)+,R1
004164  012600                                  MOV     (SP)+,R0
004166  000137  001262                          JMP     STARTX

004172  050200  053517  051105  1$:             .ASCIZ  <ACRLF>/POWER/<ACRLF>
004200  000200
                                                .EVEN
                                        ;**********
                                        ;
                                        ;BINARY TO ASCII CONVERSION (1 TO 5 ASCII CHARACTERS)
                                        ;
                                        ;CALLING SEQUENCE
                                        ;
                                        ;       MOV     ADDRESS OF LOC TO STORE FIRST ASCII CHAR. INTO R0
                                        ;       MOV     BINARY NUMBER TO BE CONVERTED INTO R1
                                        ;       MOV     NUMBER TO BE CONVERTED AS A POWER OF TEN INTO R2
                                        ;       BTOASC
                                        ;
                                        ;**********

004202  010237  004266                  $BTASC: MOV     R2,CNVCTR               ;SAVE TEN POWER
004206  006302                                  ASL     R2                      ;R2*2
004210  062702  004274                          ADD     #ADTENP,R2              ;CALCULATE ADDRESS OF STARTING TEN POWER
004214  014237  004272                  1$:     MOV     -(R2),TENPWR            ;POWER OF TEN VALUE TO TENPWR
004220  005037  004270                          CLR     DIGIT                   ;CLEAR CURRENT DIGIT
004224  163701  004272                  2$:     SUB     TENPWR,R1               ;SUBTRACT TEN POWER FROM BINARY VALUE
004230  103403                                  BCS     3$                      ;BRANCH IF END
004232  005237  004270                          INC     DIGIT
004236  000772                                  BR      2$
004240  063701  004272                  3$:     ADD     TENPWR,R1               ;RESTORE SUBTRACTED VALUE
004244  062737  000060  004270                  ADD     #60,DIGIT               ;CONVERT (DIGIT) TO ASCII
004252  113720  004270                          MOVB    DIGIT,(R0)+             ;PUT ASCII CHAR INTO USER BUFFER
004256  005337  004266                          DEC     CNVCTR                  ;FINISH ALL CHARS CALLED FOR
004262  001354                                  BNE     1$                      ;BRANCH IF NOT FINISHED
004264  000002                                  RTI                             ;RETURN


004266  000000                          CNVCTR: .WORD   0                       ;CONVERSION CHARACTER COUNT
004270  000000                          DIGIT:  .WORD   0                       ;CONVERTED CHARACTER
004272  000000                          TENPWR: .WORD   0                       ;CURRENT TEN POWER

004274  000001  000012  000144          ADTENP: .WORD   1.,10.,100.,1000.,10000.
004302  001750  023420



                                        ;********
                                        ;
                                        ;TESTC-- CHECKS FOR INPUTTED OCTAL DIGIT
                                        ;        BETWEEN A 0 AND A 7 INCLUSIVE
                                        ;
                                        ;********

004306  013700  001124                  $TESTC: MOV     TEMPCH,R0               ;GET CHAR
004312  020027  000060                          CMP     R0,#60                  ;CHECK IF NUMERIC AND EQ .GT 0
004316  103407                                  BLO     1$                      ;BRANCH ERROR
004320  020027  000067                          CMP     R0,#67                  ;CHECK IF EQ OR LT 7
004324  101004                                  BHI     1$                      ;BRANCH ERROR
004326  062716  000002                          ADD     #2,@SP                  ;SET UP RETURN ADDRESS
004332  042700  177770                          BIC     #177770,R0              ;SAVE ONLY THE DIGIT
004336  000002                          1$:     RTI                             ;NORMAL RETURN
```

```
                                ;**********
                                ;
                                ;SCRLF-- A COMMON ROUTINE TO OUTPUT A CR AND LF TO
                                ;            THE TEST TERMINAL ONLY.
                                ;
                                ;**********

004340  112700  000015          $SCRLF: MOVB    #15,R0          ;SEND A CR
004344  104021                          ECHO                    ;WAIT UNTIL PRINTER IS READY
004346  112700  000012                  MOVB    #12,R0          ;SEND A LF
004352  104021                          ECHO
004354  000002                          RTI                     ;RETURN TO CALLER


                                ;XXXXXXXXXX
                                ;
                                ;CRLF-- ROUTINES TO SEND A CR AND/OR LF TO ALL TERMINALS.
                                ;
                                ;XXXXXXXXXX

004356  104014                  $CRLF:  CR                      ;SEND CR
004360  012700  000012          $LF:    MOV     #12,R0          ;LF TO R0
004364  104011                          PRINTC                  ;SEND IT
004366  000002                          RTI                     ;RETURN

004370  012700  000015          $CR:    MOV     #15,R0          ;CR TO R0
004374  104011                          PRINTC                  ;SEND IT
004376  000002                          RTI                     ;RETURN


                                ;********
                                ;
                                ;ROUTINE TO PRINT TEST HEADER
                                ;
                                ;********

004400  104002                  $PRHDR: TYPEM                   ;PRINT MESG
004402  017033                          HDRMSG
004404  013700  001106                  MOV     RTNNO,R0        ;GET TEST NUMBER
004410  006200                          ASR     R0              ;GET FIRST DIGIT
004412  006200                          ASR     R0
004414  006200                          ASR     R0
004416  042700  177770                  BIC     #177770,R0      ;MASK FIRST DIGIT
004422  062700  000060                  ADD     #60,R0          ;MAKE ASCII
004426  104011                          PRINTC                  ;PRINT IT
004430  013700  001106                  MOV     RTNNO,R0        ;GET TEST NUMBER AGAIN
004434  042700  177770                  BIC     #177770,R0      ;MASK LAST DIGIT
004440  062700  000060                  ADD     #60,R0          ;MAKE ASCII
004444  104011                          PRINTC                  ;PRINT IT
004446  104006                          CRLF                    ;CR-LF
004450  104010                          LF                      ;BLANK LINE
004452  000002                          RTI                     ;RETURN
```

```
                                        ;**********
                                        ;
                                        ;PRINTC--THIS ROUTINE IS USED TO DRIVE EACH OF THE EXISTING TERMINALS
                                        ;        ON EACH OF THE EXISTING DH11'S( AS DEFINED BY THE SET UP IN ELTAB).
                                        ;        IF IN THE MAINTENANCE MODE SR BIT 13 CONTROLS WHETHER OR NOT
                                        ;        ALL DH11'S ARE DRIVEN OR ONLY THE TERMINAL UNDER TEST.  SET
                                        ;        BIT 13 DOWN TO DRIVE ALL TERMINALS ON ALL DH11'S. SET BIT 13 UP TO
                                        ;        DRIVE ONLY THE TERMINAL UNDER TEST.
                                        ;        EACH TERMINAL IS DRIVEN ONE CHARACTER AT A TIME.
                                        ;        PRINTC WILL LOOP WAITING FOR THE FIRST TERMINAL TO BE READY
                                        ;        ENTER WITH CHAR TO PRINT IN R0.
                                        ;
                                        ;**********

004454  010046                          $PRTC:  MOV     R0,-(SP)        ;SAVE R0
004456  010146                                  MOV     R1,-(SP)        ;SAVE R1
004460  010246                                  MOV     R2,-(SP)        ;SAVE R2
004462  010346                                  MOV     R3,-(SP)        ;SAVE R3
004464  010446                                  MOV     R4,-(SP)        ;SAVE R4
004466  010546                                  MOV     R5,-(SP)        ;SAVE R5
004470  005737  001224                          TST     IOSW            ;DH11 OR DJ11?
004474  001402                                  BEQ     1$
004476  000137  005324                          JMP     PRINTJ          ;GO TO DJ11 ROUTINE
004502  005737  001230                  1$:     TST     DHCNT           ;ANY DH11'S PRESENT?
004506  001562                                  BEQ     12$             ;RETURN IF NONE
004510  032777  020000  174526                  BIT     #BIT13,@SR      ;CHECK IF SR BIT13 IS SET
004516  001445                                  BEQ     6$              ;DRIVE ALL TERMINALS IF NOT SET
004520  104021                                  ECHO                    ;OUTPUT CHAR
004522  104022                                  INRDY                   ;CHECK IF ANY INPUT
004524  000440                                  BR      18$             ;NO,RETURN
004526  023727  001124  000177                  CMP     TEMPCH,#177     ;INPUT,CHECK IF A RUBOUT
004534  001402                                  BEQ     2$
004536  000137  005246                          JMP     ENDITR          ;NO RUBOUT, RETURN
004542  023727  001106  000024          2$:     CMP     RTNNO,#24       ;CHECK IF TEST 24
004550  001004                                  BNE     3$              ;BRANCH IF NOT
004552  012766  012054  000014                  MOV     #TERM,14(SP)    ;SET RETURN ADR
004560  000535                                  BR      12$             ;RETURN TO EXIT TEST PROPERLY
004562  023727  001106  000021          3$:     CMP     RTNNO,#21       ;TEST 21?
004570  001004                                  BNE     4$              ;BRANCH IF NOT
004572  012766  011064  000014                  MOV     #E021B,14(SP)   ;SET RETURN TO EXIT TEST PROPERLY
004600  000525                                  BR      12$             ;RETURN
004602  023727  001106  000022          4$:     CMP     RTNNO,#22       ;TEST 22?
004610  001004                                  BNE     5$              ;CONTINUE IF NOT
004612  012766  011144  000014                  MOV     #E022B,14(SP)   ;SET RETURN ADR
004620  000515                                  BR      12$             ;RETURN TO EXIT TEST PROPERLY
004622  000137  002450                  5$:     JMP     TTY1H           ;GO WAIT
004626  000137  005262                  18$:    JMP     ENDIT
004632  013737  001134  001232          6$:     MOV     DHADR,SCR1      ;INIT ADDR OF FIRST DH11
004640  012705  016560                          MOV     #ELTAB,R5       ;INIT ADDR TO EXISTING TERM TAB
004644  012704  015560                          MOV     #DH1100,R4      ;INIT ADDR TO VP TAB
004650  013703  001230                          MOV     DHCNT,R3        ;INIT DH11 COUNT
004654  012702  000001                  7$:     MOV     #1,R2           ;INIT CURRENT LINE NO.
004660  005001                                  CLR     R1              ;SET UP CURRENT CHANNEL NUMBER
004662  013737  001232  001234                  MOV     SCR1,SCR2       ;SET SCR2 = ADDR OF CURRENT DH11
```

```
004670  062737  000012  001234          ADD     #12,SCR2          ;SET SCR2 = ADDR OF BAR
004676  031502                   8$:    BIT     @R5,R2            ;TEST IF TERMINAL EXISTS
004700  001147                          BNE     17$               ;BRANCH IF NO TERMINAL
004702  037702  174326           9$:    BIT     @SCR2,R2          ;TEST IF OK TO SEND
004706  001375                          BNE     9$                ;TEST AGAIN
004710  062737  000004  001234          ADD     #4,SCR2           ;ADDR OF SILO STATUS
004716  112777  000020  174310          MOVB    #20,@SCR2         ;SET SILO OVERFLOW TO 16
004724  162737  000016  001234          SUB     #16,SCR2          ;SET SCR2 AS ADDR OF SCR
004732  110177  174276                  MOVB    R1,@SCR2          ;PUT CHANNEL NO. INTO SCR
004736  062737  000002  001234          ADD     #2,SCR2           ;SET CHAR BUF ADR
004744  005777  174264                  TST     @SCR2             ;ANY INPUT?
004750  100064                          BPL     16$               ;CONTINUE IF NONE
004752  017737  174256  001124          MOV     @SCR2,TEMPCH      ;GET CHAR
004760  042737  177600  001124          BIC     #177600,TEMPCH    ;MASK CHAR
004766  023727  001124  000177          CMP     TEMPCH,#177       ;CHECK IF RUBOUT
004774  001032                          BNE     14$               ;BRANCH IF NOT RUBOUT
004776  023727  001106  000024          CMP     RTNNO,#24         ;TEST 24?
005004  001004                          BNE     10$               ;BRANCH IF NOT
005006  012766  012054  000014          MOV     #TERM,14(SP)      ;SET RETURN ADR
005014  000517                          BR      ENDITD            ;RETURN TO EXIT TEST PROPERLY
005016  023727  001106  000021  10$:    CMP     RTNNO,#21         ;TEST21?
005024  001004                          BNE     11$               ;BRANCH IF NOT
005026  012766  011064  000014          MOV     #E021B,14(SP)     ;SET RETURN ADR
005034  000507                          BR      ENDITD            ;RETURN TO EXIT TEST PROPERLY
005036  023727  001106  000022  11$:    CMP     RTNNO,#22         ;TEST 22?
005044  001004                          BNE     13$               ;BRANCH IF NOT
005046  012766  011144  000014          MOV     #E022B,14(SP)     ;SET RETURN ADR
005054  000477                   12$:   BR      ENDITD            ;RETURN TO EXIT TEST PROPERLY
005056  000137  002450           13$:   JMP     TTY1H             ;CONTROL
005062  023727  001124  000003   14$:   CMP     TEMPCH,#3         ;CHAR = CONTROL-C ?
005070  001004                          BNE     15$               ;CONTINUE IF NOT
005072  023727  001106  000024          CMP     RTNNO,#24         ;TEST 24?
005100  001465                          BEQ     ENDITD            ;EXIT IF TEST 24
005102  013737  001124  001114   15$:   MOV     TEMPCH,REPT       ;SAVE CHAR FOR TESTS 21 AND 22
005110  010046                          MOV     R0,-(SP)          ;SAVE R0
005112  012700  000036                  MOV     #30.,R0           ;DELAY FOR HALF DUPLEX
005116  104003                          DELAY
005120  012600                          MOV     (SP)+,R0          ;RESTORE R0
005122  062737  000002  001234   16$:   ADD     #2,SCR2           ;SCR2 EQ ADDR OF LPR
005130  011477  174100                  MOV     (R4),@SCR2        ;STORE VP INTO LPR
005134  062737  000002  001234          ADD     #2,SCR2           ;ADD 2 TO ADDDR IN SCR2
005142  010146                          MOV     R1,-(SP)          ;SAVE R1
005144  006301                          ASL     R1                ;FIND TABLE POINTER
005146  006301                          ASL     R1                ;TO STORE CHAR
005150  006301                          ASL     R1                ;FOR THIS CHANNEL
005152  006301                          ASL     R1
005154  060301                          ADD     R3,R1
005156  062701  006007                  ADD     #CHARAC-1,R1
005162  110011                          MOVB    R0,(R1)           ;STORE CHAR
005164  010177  174044                  MOV     R1,@SCR2          ;ADDR OF CHAR INTO CARA
005170  012601                          MOV     (SP)+,R1          ;RESTORE R1
005172  062737  000002  001234          ADD     #2,SCR2           ;ADD 2 TO ADDR IN SCR2
005200  012777  177777  174026          MOV     #177777,@SCR2     ;SET CHAR COUNT EQ 1
005206  062737  000002  001234          ADD     #2,SCR2           ;ADD 2 TO ADDR IN SCR2
```

```
        005214  050277  174014                  BIS     R2,@SCR2        ;SET LINE BIT IN BAR
        005220  005724                  17$:    TST     (R4)+           ;INC PTR TO VPTSB FOR NEXT TERM
        005222  005201                          INC     R1              ;INCREMENT CHANNEL NO.
        005224  006302                          ASL     R2              ;ROTATE LINE NO. MASK TO NEXT POS.
        005226  001367                          BNE     3$              ;DO NEXT TERM. ON SAME DH11
        005230  005303                          DEC     R3              ;DEC COUNT OF DH11'S
        005232  001413                          BEQ     ENDIT           ;BRANCH IF ALL DONE
        005234  012737  000020  001232          MOV     #20,SCR1        ;SET UP FOR NEXT DH11
        005242  005725                          TST     (R5)+           ;INC PTR TO EXISTING TERM. TBL.
        005244  000603                          BR      7$              ;DO NEXT DH11

        005246  013737  001124  001114  ENDITS: MOV     TEMPCH,REPT     ;SAVE CHAR FOR TESTS 21 & 22
        005254  012700  000036          ENDITD: MOV     #30.,R0         ;DELAY FOR HALF DUPLEX
        005260  104003                          DELAY

        005262  012605                  ENDIT:  MOV     (SP)+,R5
        005264  012604                          MOV     (SP)+,R4
        005266  012603                          MOV     (SP)+,R3
        005270  012602                          MOV     (SP)+,R2
        005272  012601                          MOV     (SP)+,R1
        005274  012600                          MOV     (SP)+,R0
        005276  023727  001124  000003          CMP     TEMPCH,#3       ;CHAR = CONTROL C ?
        005304  001006                          BNE     1$              ;EXIT IF NOT
        005306  023727  001106  000024          CMP     RTNNO,#24       ;TEST 24?
        005314  001002                          BNE     1$              ;EXIT IF NOT
        005316  012716  011770                  MOV     #E024R,(SP)     ;YES, SET RETURN ADR
        005322  000002                  1$:     RTI                     ;RETURN
```

```
                                                ;**********
                                                ;
                                                ;PRINTJ--THIS ROUTINE IS USED TO DRIVE EACH OF THE EXISTING TERMINALS
                                                ;       ON EACH OF THE EXISTING DJ11S' (AS DEFINED BY THE SET UP IN
                                                ;       "ELTAB"). IF IN THE MAINTENANCE MODE, SR BIT 13 CONTROLS
                                                ;       WHETHER OR NOT ALL DJ11S' ARE DRIVEN OR ONLY THE TERMINAL
                                                ;       UNDER TEST. EACH TERMINAL IS DRIVEN ONE AT A TIME. PRINTJ
                                                ;       WILL LOOP WAITING FOR THE FIRST ONE TO BE READY TO SEND
                                                ;       ENTER WITH CHARACTER TO SEND IN R0.
                                                ;
                                                ;**********
005324  005737  001226          PRINTJ: TST     DJCNT           ;ANY DJ11S'
005330  001754                          BEQ     ENDIT           ;NO, RETURN
005332  032777  020000  173704          BIT     #BIT13,@SR      ;CHECK IF SR 13 IS SET
005340  001441                          BEQ     4$              ;CLEAR, DRIVE ALL TERMIINALS
005342  104021                          ECHO                    ;OUTPUT CHAR TO TERM UNDER TEST
005344  104022                          INRDY                   ;CHECK IF ANY INPUT
005346  000745                          BR      ENDIT           ;NO, RETURN
005350  023727  001124  000177          CMP     TEMPCH,#177     ;YES CKECK IF A  RUBOUT
005356  001333                          BNE     ENDITR          ;NO, RETURN
005360  023727  001106  000024          CMP     RTNNO,#24       ;TEST 24?
005366  001004                          BNE     1$              ;BRANCH IF NOT
005370  012766  012054  000014          MOV     #TERM,14(SP)    ;SET RETURN ADR
005376  000726                          BR      ENDITD          ;RETURN TO EXIT TEST PROPERLY
005400  023727  001106  000021  1$:     CMP     RTNNO,#21       ;TEST 21?
005406  001004                          BNE     2$              ;BRANCH IF NOT
005410  012766  011064  000014          MOV     #EC21B,14(SP)   ;SET RETURN ADR
005416  000716                          BR      ENDITD          ;RETURN TO EXIT TEST PROPERLY
005420  023727  001106  000022  2$:     CMP     RTNNO,#22       ;TEST 22?
005426  001004                          BNE     3$              ;BRANCH IF NOT
005430  012766  011144  000014          MOV     #EC22B,14(SP)   ;SET RETURN ADR
005436  000706                          BR      ENDITD          ;RETURN TO EXIT TEST PROPERLY
005440  000137  002450          3$:     JMP     TTYIH           ;GO WAIT
005444  012737  160010  001232  4$:     MOV     #160010,SCR1    ;INIT ADDR OF FIRST DJ11
005452  012705  016560                  MOV     #ELTAB,R5       ;INIT ADDR OF EXISTING TERM TAB
005456  013703  001226                  MOV     DJCNT,R3        ;COUNT OF DJ11S' TO R3
005462  012702  000001          5$:     MOV     #1,R2           ;INIT CURRENT LINE NO.
005466  005001                          CLR     R1              ;INIT CURRENT CHANNEL NO.
005470  013737  001232  001234  6$:     MOV     SCR1,SCR2       ;SET SCR2=ADDR OF CURRENT DJ11
005476  062737  000004  001234          ADD     #4,SCR2         ;SCR2 IS ADDR OF TCR
005504  031502                          BIT     @R5,R2          ;TEST IF TERMINAL EXISTS
005506  001124                          BNE     15$             ;BRANCH IF NO TERMINAL
005510  010277  173520                  MOV     R2,@SCR2        ;YES,SET LINE NO. IN TCR
005514  162737  000004  001234          SUB     #4,SCR2         ;SCR2 IS NOW ADDR OF CSR.
005522  105777  173506                  TSTB    @SCR2           ;CHECK FOR INPUTS
005526  100072                          BPL     13$             ;CONTINUE IF NO INPUT
005530  062737  000002  001234          ADD     #2,SCR2         ;SET CHAR BUF REG ADR
005536  017737  173472  001124          MOV     @SCR2,TEMPCH    ;GET INPUT CHAR
005544  042737  177600  001124          BIC     #177600,TEMPCH  ;MASK CHAR
005552  023727  001124  000177          CMP     TEMPCH,#177     ;CHECK CHAR
005560  001032                          BNE     11$             ;BRANCH IF NOT RUBOUT
005562  023727  001106  000024          CMP     RTNNO,#24       ;TEST 24?
005570  001004                          BNE     7$              ;BRANCH IF NOT
```

```
005572  012766  012064  000014          MOV     #TERM,14(SP)    ;SET RETURN ADR
005600  000526                          BR      ENDITD          ;RETURN TO EXIT TEST PROPERLY
005602  023727  001106  000021  7$:     CMP     RTNNO,#21       ;TEST 21?
005610  001004                          BNE     9$              ;BRANCH IF NOT
005612  012766  011064  000014          MOV     #E021B,14(SP)   ;SET RETURN ADR
005620  000515                          BR      ENDITD          ;RETURN TO EXIT TEST PROPERLY
005622  023727  001106  000022  8$:     CMP     RTNNO,#22       ;TEST 22?
005630  001004                          BNE     10$             ;BRANCH IF NOT
005632  012766  011144  000014          MOV     #E022B,14(SP)   ;SET RETURN ADR
005640  000506                  9$:     BR      ENDITD          ;RETURN TO EXIT TEST PROPERLY
005642  000137  002450          10$:    JMP     TTYIH           ;GO TO CONTROL
005646  023727  001124  000003  11$:    CMP     TEMPCH,#3       ;CHAR = CONTROL-C ?
005654  001004                          BNE     12$             ;BRANCH IF NOT
005656  023727  001106  000024          CMP     RTNNO,#24       ;TEST 24?
005664  001765                          BEQ     9$              ;YES, RETURN TO TEST
005666  013737  001124  001114  12$:    MOV     TEMPCH,REPT     ;SAVE CHAR FOR TESTS 21 & 22
005674  010046                          MOV     R0,-(SP)        ;SAVE R0
005676  012700  000036                  MOV     #30.,R0         ;DELAY FOR HALF DUPLEX
005702  104003                          DELAY
005704  012600                          MOV     (SP)+,R0        ;RESTORE R0
005706  162737  000002  001234          SUB     #2,SCR2         ;RESET PROPER ADR FOR PRINT
005714  052777  000400  173312  13$:    BIS     #BIT8,@SCR2     ;START TRANSMITTER SCANNER
005722  005777  173306          14$:    TST     @SCR2           ;CHECK STATE OF CSR
005726  100375                          BPL     14$             ;BRANCH IF XMITTER NOT READY
005730  062737  000006  001234          ADD     #6,SCR2         ;READY, SCR2 NOW=ADDR OF TBUF
005736  017704  173272                  MOV     @SCR2,R4        ;GET CONTENTS OF TBUF
005742  000304                          SWAB    R4
005744  042704  177760                  BIC     #177760,R4      ;SAVE ONLY LINE NO.
005750  020401                          CMP     R4,R1           ;BE SURE SCANNER IS ON CORRECT LINE
005752  001346                          BNE     6$              ;BRANCH IF NOT, TRY AGAIN
005754  110077  173254                  MOVB    R0,@SCR2        ;LOAD TBUF WITH CHAR
005760  005201                  15$:    INC     R1              ;INCREMENT LINE NO.
[illegible]                             [illegible]             ;SET LINE NO. TO NEXT POSITION
[illegible]                             [illegible]             ;IF CARRY IS CLEAR DZ11 IS DONE
[illegible]                             [illegible]             ;DEC COUNT OF DZ11S
[illegible]                             [illegible] 16$         ;BRANCH IF NOT DONE
[illegible]     005662                  JMP     EXIT            ;DONE
[illegible]     000010  001232  16$:    ADD     #10,SCR1        ;SET SCR1 TO ADDR OF NEXT DZ11
[illegible]                             [illegible] (R5)+       ;SET R5 TO NEXT ELVAS ENTRY
[illegible]                             BR      6$              ;GO DO NEXT DZ11


006010  000400                  CHARAI: .BLKB   256.            ;CHARACTER STORAGE FOR OUTPUT
```

```
                                        .SBTTL  PRINTER TESTS


                                ;XXXXXXXXXXX
                                ;
                                ;PT0 -- DATA PATH TEST---FOUR LINES OF ALTERNATING
                                ;       "*" AND "U" ARE PRINTED, OUT TO THE GIVEN PAPER
                                ;       WIDTH THE PATTERN WILL APPEAR AS FOLOWS.
                                ;
                                ;       *U*U*U*U*U*U
                                ;       U*U*U*U*U*U*
                                ;       *U*U*U*U*U*U
                                ;       U*U*U*U*U*U*
                                ;
                                ;XXXXXXXXXXX

006410  000000                  PT0:    0                       ;TEST NUMBER
006412  006464                          PT1                     ;NEXT TEST
006414  104012                          PRTHDR                  ;PRINT TEST HEADER
006416  104002                          TYPEM                   ;PRINT COLUMN MESG
006420  017045                          HDRC
006422  012703  025125          1$:     MOV     #"U+,R3         ;SET FIRST CHAR PAIR
006426  012702  000020                  MOV     #16.,R2         ;SET LINE COUNT
006432  010300                  2$:     MOV     R3,R0           ;SET CHAR PAIR
006434  013701  001112                  MOV     WIDTH,R1        ;SET COLUMN COUNT
006440  104011                  3$:     PRINTC                  ;PRINT CHAR
006442  000300                          SWAB    R0              ;SET NEXT CHAR
006444  005301                          DEC     R1              ;DEC COLUMN COUNT
006446  001374                          BNE     3$              ;FINISH LINE
006450  000303                          SWAB    R3              ;SET NEXT START CHAR
006452  104006                          CRLF                    ;CR-LF
006454  005302                          DEC     R2              ;DEC LINE COUNT
006456  001365                          BNE     2$              ;FINISH TEST
006460  104001                          CHAIN                   ;ALL DONE, EXIT
006462  000763                          BR      2$              ;REPEAT TEST
```

```
                                        ;XXXXXXXXXX
                                        ;
                                        ;PT1 -- PRINTER CHARACTER TEST --- PRINTS ALL PRINTABLE CHARACTERS
                                        ;
                                        ;XXXXXXXXXX

006464  000001                          PT1:    1                               ;TEST NUMBER
006466  006606                                  PT2                             ;NEXT TEST
006470  104012                                  PRTHDR                          ;PRINT TEST HEADER
006472  012701  000040                  1$:     MOV     #40,R1                  ;SPACE TO R1
006476  012702  000100                          MOV     #100,R2                 ;@ TO R2
006502  012703  000140                          MOV     #140,R3                 ;\ TO R3
006506  010100                          2$:     MOV     R1,R0                   ;FIRST CHAR TO R0
006510  004737  006556                          JSR     PC,SPSP                 ;SEND TWO SPACES
006514  010200                                  MOV     R2,R0                   ;SECOND CHAR TO R0
006516  004737  006556                          JSR     PC,SPSP                 ;SEND TWO SPACES
006522  012704  000003                          MOV     #3,R4                   ;CHAR COUNT TO R4
006526  010300                                  MOV     R3,R0                   ;THIRD CHAR TO R0
006530  104011                          3$:     PRINTC                          ;PRINT CHAR
006532  005304                                  DEC     R4                      ;THREE TIMES ?
006534  001375                                  BNE     3$                      ;BRANCH IF NOT
006536  104006                                  CRLF                            ;CR-LF
006540  122122                                  CMPB    (R1)+,(R2)+             ;SET NEXT CHARS
006542  105723                                  TSTB    (R3)+
006544  020327  000200                          CMP     R3,#200                 ;CHECK IF ALL DONE
006550  103756                                  BLO     2$                      ;BRANCH IF NOT
006552  104001                                  CHAIN                           ;EXIT TO NEXT TEST
006554  000746                                  BR      1$                      ;REPEAT TEST

006556  012704  000003                  SPSP:   MOV     #3,R4                   ;SET PRINT COUNT
006562  104011                          1$:     PRINTC                          ;PRINT CHAR
006564  005304                                  DEC     R4                      ;DEC PRINT COUNT
006566  001375                                  BNE     1$                      ;FINISH CHAR

006570  012700  000040                  SP2:    MOV     #40,R0                  ;SPACE TO R0
006574  104011                                  PRINTC                          ;PRINT FIRST SPACE

006576  012700  000040                  SP0:    MOV     #40,R0                  ;SPACE TO R0
006602  104011                                  PRINTC                          ;PRINT SECOND SPACE
006604  000207                                  RTS     PC                      ;RETURN
```

```
                                      ;XXXXXXXXXXXX
                                      ;
                                      ;PT2 -- NON-PRINTING CHARACTER TEST.  THIS TEST
                                      ;       PRINTS THE OCTAL CODE FOLLOWED BY THE MNEMONIC
                                      ;       OF ALL NON-PRINTING CHARACTERS.  FOLLOWING EACH
                                      ;       MNEMONIC, THE PRINTER IS DRIVEN BY THE NON-PRINTING
                                      ;       CODE (000 THROUGH 037 PLUS 177).  ALL CONTROL CHARACTERS
                                      ;       (INCLUDING THOSE FOR OPTIONS) WILL BE SKIPPED.
                                      ;       REFER TO THE DOCUMENT FOR A LIST OF THOSE PRINTED.
                                      ;
                                      ;XXXXXXXXXXXX

      006606  000002                  PT2:    2                       ;TEST NUMBER
      006610  007236                          PT3                     ;NEXT TEST
      006612  104012                          PRTHDR                  ;PRINT TEST HEADER
      006614  005003                  1$:     CLR     R3              ;NON-PRINTABLE CHAR..NULL IS FIRST
      006616  012701  006774                  MOV     #LINE2,R1       ;ADDR OF CHAR STRING TO R1
      006622  012702  000003          2$:     MOV     #3,R2           ;NO. OF CHAR GROUPS PER LINE
      006626  012704  000010          3$:     MOV     #10,R4          ;NO. OF CHARS PER GROUP
      006632  112100                  4$:     MOVB    (R1)+,R0        ;CHAR INTO R0
      006634  104011                          PRINTC                  ;PRINT CHAR
      006636  005304                          DEC     R4              ;9 CHARS. PRINTED?
      006640  001374                          BNE     4$              ;BRANCH IF NOT
      006642  022703  000002                  CMP     #2,R3           ;CHAR = STX?
      006646  001420                          BEQ     7$              ;YES, SET NEXT CHAR
      006650  022703  000004                  CMP     #4,R3           ;CHAR = EOT?
      006654  001414                          BEQ     6$              ;YES, SET NEXT CHAR
      006656  022703  000033                  CMP     #33,R3          ;CHAR = ESC?
      006662  001412                          BEQ     7$              ;YES, SET NEXT CHAR
      006664  022703  000007                  CMP     #7,R3           ;CHAR = BELL?
      006670  001002                          BNE     5$              ;BRANCH IF NOT A BELL
      006672  012703  000020                  MOV     #20,R3          ;SET NEXT CHAR
      006676  022703  000040          5$:     CMP     #40,R3          ;IS IT THE LAST?
      006702  001003                          BNE     8$              ;BRANCH IF NO
      006704  000421                          BR      11$             ;YES, OUTPUT LAST CHAR (177)
      006706  005203                  6$:     INC     R3              ;SKIP CHAR
      006710  005203                  7$:     INC     R3              ;SKIP CHAR
      006712  010300                  8$:     MOV     R3,R0           ;NON-PRINTABLE CHAR TO R0
      006714  012704  000003                  MOV     #3,R4           ;A COUNT OF 3 TO R4
      006720  104011                  9$:     PRINTC                  ;DRIVE PRINTER WITH NON-PRINTABLE CHAR
      006722  005304                          DEC     R4              ;DECREMENT COUNTER
      006724  001375                          BNE     9$              ;BRANCH IF NOT ZERO (3 TIMES)
      006726  005203                          INC     R3              ;INCREMENT CHAR.CODE
      006730  005302                          DEC     R2              ;DEC. GROUPS PER LINE COUNTER (3)
      006732  001404                          BEQ     10$             ;BRANCH IF ZERO
      006734  004737  006570                  JSR     PC,SP3          ;SEND 3 SPACES
      006740  104011                          PRINTC
      006742  000731                          BR      3$              ;CONTINUE
      006744  104006                  10$:    CRLF                    ;SEND A CR,LF
      006746  000725                          BR      2$              ;GO DO NEXT LINE
      006750  012704  000003          11$:    MOV     #3,R4           ;A 3 COUNT TO R4
      006754  012700  000177                  MOV     #177,R0         ;A DEL TO R0
      006760  104011                  12$:    PRINTC                  ;PRINT CHAR
      006762  005304                          DEC     R4              ;DECREMENT COUNTER
```

```
  1408  006764  001375                            BNE     12$                     ;BRANCH IF NOT ZERO
  1409  006766  104006                            CRLF                            ;SEND A CR, LF
  1410  006770  104001                            CHAIN                           ;CHAIN TO NEXT TEST
  1411  006772  000710                            BR      1$                      ;REPEAT TEST
  1412
  1413
  1414  006774  030060  020060  047040  LINE2:  .ASCII   000 NUL001 SOH002 STX
  1415  007002  046125  030060  020061
  1416  007010  051440  044117  030060
  1417  007016  020062  051440  054124
  1418  007024  030060  020066  040440          .ASCII   006 ACK020 DLE021 DC1
  1419  007032  045503  031060  020060
  1420  007040  042040  042514  031060
  1421  007046  020061  042040  030503
  1422  007054  031060  020062  042040          .ASCII   022 DC2023 DC3024 DC4
  1423  007062  031103  031060  020063
  1424  007070  042040  031503  031060
  1425  007076  020064  042040  032103
  1426  007104  031060  020065  047040          .ASCII   025 NAK026 SYN027 ETB
  1427  007112  045501  031060  020066
  1428  007120  051440  047131  031060
  1429  007126  020067  042440  041124
  1430  007134  031460  020060  041440          .ASCII   030 CAN031 EM 032 SUB
  1431  007142  047101  031460  020061
  1432  007150  042440  020115  031460
  1433  007156  020062  051440  041125
  1434  007164  031460  020064  043040          .ASCII   034 FS 035 GS 036 RS
  1435  007172  020123  031460  020065
  1436  007200  043440  020123  031460
  1437  007206  020066  051040  020123
  1438  007214  031460  020067  052440          .ASCII   037 US 177 DEL
  1439  007222  020123  033461  020067
  1440  007230  042040  046105     040
  1441          007236                          .EVEN
```

```
                                    ;XXXXXXXXXX
                                    ;
                                    ;PT3 --  CARRIAGE RETURN TEST --
                                    ;       THE LINE CONSISTS OF A STRING OF O'S AND
                                    ;       X'S.  FIRST, THE O'S ARE PRINTED OUT TO THE LAST
                                    ;       COLUMN WITH A SPACE SEPARATING EACH.  THEN THE
                                    ;       CARRIAGE IS SPACED TO THE FIRST BLANK SPACE, AND X
                                    ;       PRINTED AND THE RETURNED TO THE MARGIN.  THIS
                                    ;       PROCESS IS CONTINUE UNTIL ALL SPACES BETWEEN
                                    ;       THE ZEROES HAVE BEEN FILLED.
                                    ;
                                    ;XXXXXXXXXX

007236  000003                      PT3:    3                       ;TEST NUMBER
007240  007356                              PT4                     ;NEXT TEST
007242  104012                              PRTHDR                  ;PRINT TEST HEADER
007244  005037  001116              1$:     CLR     SPCNT           ;CLEAR SPACE COUNTER
007250  013701  001112                      MOV     WIDTH,R1        ;POSITION COUNTER TO R1
007254  012700  000117              2$:     MOV     #117,R0         ;"O" TO R0
007260  104011                              PRINTC                  ;PRINT THE "O"
007262  005301                              DEC     R1              ;DECREMENT POSITION COUNTER
007264  001404                              BEQ     3$              ;BRANCH IF 0
007266  004737  006576                      JSR     PC,SPC          ;PRINT A SPACE
007272  005301                              DEC     R1              ;DECREMENT POSITION COUNTER
007274  001367                              BNE     2$              ;BRANCH IF NOT ZERO
007276  104014                      3$:     CR                      ;SEND CR
007300  012737  000001  001116              MOV     #1,SPCNT        ;SPACE, COUNTER SET TO 1
007306  013701  001116              4$:     MOV     SPCNT,R1        ;NO. OF SPACES TO R1
007312  004737  006576              5$:     JSR     PC,SPC          ;PRINT SPACE
007316  005301                              DEC     R1              ;DECREMENT SPACE COUNTER
007320  001374                              BNE     5$              ;BRANCH IF NOT ZERO
007322  012700  000130                      MOV     #130,R0         ;"X" INTO R0
007326  104011                              PRINTC                  ;PRINT "X"
007330  104014                              CR                      ;SEND CR
007332  062737  000002  001116              ADD     #2,SPCNT        ;INCREMENT SPACE COUNT BY 2
007340  023737  001116  001112              CMP     SPCNT,WIDTH     ;COMPARE POSITION COUNTER WITH COLM. COUNT
007346  103757                              BLO     4$              ;BRANCH IF LOWER
007350  104010                              LF                      ;SEND LF
007352  104001                              CHAIN                   ;CHAIN TO NEXT TEST
007354  000733                              BR      1$              ;REPEAT TEST
```

```
                                            ;XXXXXXXXXX

                                            ;PT4 -- MULTIPLE LINE FEED TEST -- 63 LINE FEEDS ARE
                                            ;       SENT WITH A REFERENCE LINE AT THE START AND END.
                                            ;       A NUMBER IS PRINTED WHICH INDICATES THE NUMBER OF LINE
                                            ;       FEEDS THAT WILL BE ISSUED BEFORE THE NEXT
                                            ;       NUMBER OR REFERENCE LINE IS PRINTED.

                                            ;XXXXXXXXXX

   007356  000004                           PT4:    4                       ;TEST NUMBER
   007360  007534                                   PT5                     ;NEXT TEST
   007362  104012                                   PRTHDR                  ;PRINT TEST HEADER
   007364  012737  000001  001132           1$:     MOV     #1,LFCNT        ;LINE FEED COUNT TO 1
   007372  013701  001112                           MOV     WIDTH,R1        ;COLUMN COUNT TO R1
   007376  012702  007516                           MOV     #LINE3,R2       ;ADDR OF NUMBER FIELD TO R2
   007402  004737  007466                           JSR     PC,REF          ;PRINT REFERENCE LINE
   007406  013701  001132                   2$:     MOV     LFCNT,R1        ;LINE FEED COUNT TO R1
   007412  104010                           3$:     LF                      ;SEND LF
   007414  005301                                   DEC     R1              ;DECREMENT COUNTER
   007416  001375                                   BNE     3$              ;BRANCH IF NOT YET 0
   007420  006337  001132                           ASL     LFCNT           ;DOUBLE LINE FEED COUNT
   007424  022737  000100  001132                   CMP     #BIT6,LFCNT     ;TEST IF COUNT IS 32
   007432  001406                                   BEQ     4$              ;BRANCH IF =32, END
   007434  112200                                   MOVB    (R2)+,R0        ;NUMBER TO R0
   007436  104011                                   PRINTC                  ;PRINT IT
   007440  112200                                   MOVB    (R2)+,R0        ;NUMBER TO R0
   007442  104011                                   PRINTC                  ;PRINT IT
   007444  104014                                   CR                      ;SEND CR
   007446  000757                                   BR      2$              ;DRIVE THE LINEFEEDS
   007450  013701  001112                   4$:     MOV     WIDTH,R1        ;COLUMN COUNT TO R1
   007454  004737  007466                           JSR     PC,REF          ;SEND END REFERENCE LINE
   007460  104010                                   LF                      ;SEND LF
   007462  104001                                   CHAIN
   007464  000737                                   BR      1$              ;REPEAT TEST

   007466  112200                           REF:    MOVB    (R2)+,R0        ;NUMBER TO R0
   007470  104011                                   PRINTC                  ;PRINT IT
   007472  112200                                   MOVB    (R2)+,R0        ;NUMBER TO R0
   007474  104011                                   PRINTC                  ;PRINT IT
   007476  005741                                   TST     -(R1)           ;DECREASE COUNTER BY 2
   007500  012700  000137                           MOV     #137,R0         ;DASH (-) TO R0
   007504  104011                           1$:     PRINTC                  ;PRINT IT
   007506  005301                                   DEC     R1              ;DECREMENT COLUMN COUNTER
   007510  001375                                   BNE     1$              ;BRANCH IF NO ZERO
   007512  104014                                   CR                      ;SEND CR
   007514  000207                                   RTS     PC              ;RETURN

   007516  030460  031060  032060           LINE3:  .ASCII  /01020408163200/
   007524  034060  033061  031063
   007532  030060
                                                    .EVEN
```

```
                                        ;XXXXXXXXXX
                                        ;PT5--  SINGLE LINE FEED TEST --  TESTS THE LINE FEED
                                        ;       CAPABILITY FROM ALL COLUMNS.
                                        ;XXXXXXXXXX

007534  000005                          PT5:    5                               ;TEST NUMBER
007536  007740                                  PT6                             ;NEXT TEST
007540  104012                                  PRTHDR                          ;PRINT TEST HEADER
007542  013701  001112                  1$:     MOV     WIDTH,R1                ;COLUMN COUNT TO R1
007546  005741                                  TST     -(R1)                   ;DECREASE BY 2
007550  012700  000060                          MOV     #60,R0                  ;'0' TO R0
007554  104011                          2$:     PRINTC                          ;SEND 0
007556  005301                                  DEC     R1                      ;DECREMENT COLUMN COUNTER
007560  001375                                  BNE     2$                      ;BRANCH IF NOT ZERO
007562  012700  000062                          MOV     #62,R0                  ;SEND A 2
007566  104011                                  PRINTC
007570  104011                                  PRINTC                          ;SEND A SECOND TWO
007572  023727  001112  000204                  CMP     WIDTH,#132.             ;COMPARE COLUMN COUNT
007600  001404                                  BEQ     3$                      ;BRANCH IF EQ 132
007602  012700  003410                          MOV     #3410,R0                ;DELAY 1.8 SEC
007606  104003                                  DELAY
007610  000407                                  BR      5$
007612  012700  000063                  3$:     MOV     #63,R0                  ;3'S TO R0
007616  012701  000100                          MOV     #100,R1                 ;64 TO COUNTER
007622  104011                          4$:     PRINTC                          ;SEND CHARACTER
007624  005301                                  DEC     R1                      ;DECREMENT COUNT
007626  001375                                  BNE     4$                      ;BRANCH IF NOT ZERO
007630  104006                          5$:     CRLF                            ;SEND A CR,LF
007632  013701  001112                          MOV     WIDTH,R1                ;NO. COLUMNS TO R1
007636  012700  000134                  6$:     MOV     #134,R0                 ;BACKSLASH TO R0
007642  104011                                  PRINTC                          ;SEND IT
007644  104010                                  LF                              ;SEND LF
007646  005301                                  DEC     R1                      ;DECREMENT COUNTER
007650  001372                                  BNE     6$                      ;BRANCH IF NOT ZERO.
007652  104014                                  CR                              ;SEND CR
007654  004737  007702                          JSR     PC,PT5AL                ;SEND REF LINE #1
007660  104006                                  CRLF                            ;SEND A CR,LF
007662  012700  001750                          MOV     #1750,R0                ;DELAY 1 SEC
007666  104003                                  DELAY
007670  004737  007702                          JSR     PC,PT5AL                ;SEND A SECOND REF. LINE
007674  104006                                  CRLF                            ;SEND A CR,LF
007676  104001                                  CHAIN                           ;CHAIN TO NEXT TEST
007700  000720                                  BR      1$                      ;REPEAT TEST
007702  013701  001112                  PT5AL:  MOV     WIDTH,R1                ;COLUMN COUNT TO R1
007706  012700  000061                          MOV     #61,R0                  ;"1" TO R0
007712  104011                          1$:     PRINTC                          ;PRINT R0
007714  005301                                  DEC     R1                      ;DECREMENT COUNTER
007716  001407                                  BEQ     2$                      ;BRANCH IF=0
007720  005200                                  INC     R0                      ;INCREMENT CHARACTER
007722  020027  000071                          CMP     R0,#71                  ;COMP CHAR TO "9"
007726  101771                                  BLOS    1$                      ;BRANCH IF LOWER OR SAME
007730  012700  000060                          MOV     #60,R0                  ;RESET CHAR TO "0"
007734  000766                                  BR      1$                      ;CONTINUE
007736  000207                          2$:     RTS     PC                      ;FINISHED, RETURN TO CALLER
```

```
                                        ;XXXXXXXXXX
                                        ;
                                        ;PT6--  BACKSPACE TEST -- A REFERENCE LINE SUCH AS IN
                                        ;       TEST PT5 IS PRINTED.  THE SECOND LINE CONSISTS
                                        ;       OF PRINTING A BACKSLASH, BACKSPACE AND FORWARD
                                        ;       SLASH COMBINATION OUT TO THE GIVEN COLUMN WIDTH.
                                        ;       THIS LINE IS THEN FOLLOWED BY THE SAME TWO REFERENCE
                                        ;       LINES AS PRINTED IN TEST PT5.
                                        ;
                                        ;XXXXXXXXXX

007740  000006                          PT6:    6                               ;TEST NUMBER
007742  010122                                  PT7                             ;NEXT TEST
007744  104012                                  PRTHDR                          ;PRINT TEST HEADER
007746  013701  001112                  1$:     MOV     WIDTH,R1                ;COLUMN COUNT TO R1
007752  005741                                  TST     -(R1)                   ;DECREMENT BY 2
007754  012700  000060                          MOV     #60,R0                  ;"0" TO R0
007760  104011                          2$:     PRINTC                          ;SEND 0
007762  005301                                  DEC     R1                      ;DECREMENT COLUMN COUNTER
007764  001375                                  BNE     2$                      ;BRANCH IF NOT ZERO
007766  012700  000062                          MOV     #62,R0                  ;"2" TO R0
007772  104011                                  PRINTC                          ;SEND A "2"
007774  104011                                  PRINTC                          ;SEND A SECOND "2"
007776  023727  001112  000204                  CMP     WIDTH,#132.             ;COMPARE COLUMN COUNT
010004  001404                                  BEQ     3$                      ;BRANCH IF EQ 132
010006  012700  003410                          MOV     #3410,R0                ;DELAY 1.8 SEC
010012  104003                                  DELAY
010014  000407                                  BR      5$
010016  012700  000063                  3$:     MOV     #63,R0                  ;3'S TO R0
010022  012701  000100                          MOV     #100,R1                 ;64 TO COUNTER
010026  104011                          4$:     PRINTC                          ;SEND CHAR
010030  005301                                  DEC     R1                      ;DECREMENT COUNTER
010032  001375                                  BNE     4$                      ;CONTINUE IF NOT DONE
010034  104006                          5$:     CRLF                            ;SEND A CR,LF
010036  013701  001112                          MOV     WIDTH,R1                ;COLUMN COUNT TO R1
010042  012700  000134                  6$:     MOV     #134,R0                 ;BACKSLASH TO R0
010046  104011                                  PRINTC                          ;SEND IT
010050  012700  000010                          MOV     #10,R0                  ;BACKSPACE TO R0
010054  104011                                  PRINTC                          ;SEND IT
010056  012700  000057                          MOV     #57,R0                  ;FORWORD SLASH TO R0
010062  104011                                  PRINTC                          ;SEND IT
010064  005301                                  DEC     R1                      ;END OF PAPER
010066  001365                                  BNE     6$                      ;BRANCH IF NO
010070  104010                                  LF                              ;SEND LF
010072  104014                                  CR                              ;SEND CR
010074  004737  007702                          JSR     PC,PT5AL                ;SEND REF LINE #1
010100  104006                                  CRLF                            ;SEND A CR,LF
010102  012700  001750                          MOV     #1750,R0                ;DELAY 1 SEC
010106  104003                                  DELAY
010110  004737  007702                          JSR     PC,PT5AL                ;SEND SECOND REF LINE
010114  104006                                  CRLF                            ;SEND A CR,LF
010116  104001                                  CHAIN                           ;CHAIN TO NEXT TEST
010120  000712                                  BR      1$                      ;REPEAT TEST
```

```
                                        ;XXXXXXXXXX
                                        ;
                                        ;PT7--   OVERPRINT TEST-- A ROW OF ALTERNATING M'S AND
                                        ;        SPACES ARE PRINTED, OUT TO THE LAST COLUMN AND OVERPRINTED TWICE.
                                        ;        A SECOND LINE OF ALTERNATING SPACES AND "@'S" IS THEN
                                        ;        SENT 3 TIMES AS THE FIRST LINE.  THIS IS FOLLOWED
                                        ;        BY A THIRD AND FINAL LINE OF ALTERNATING '&'
                                        ;        AND SPACES.
                                        ;
                                        ;XXXXXXXXXX

010122  000007                          PT7:    7                       ;TEST NUMBER
010124  010334                                  PT10                    ;NEXT TEST
010126  104012                                  PRTHDR                  ;PRINT TEST HEADER
010130  012703  000002                  1$:     MOV     #2,R3           ;2 COUNT TO R3
010134  013701  001112                  2$:     MOV     WIDTH,R1        ;NO. OF COLUMNS TO R1
010140  012700  000115                  3$:     MOV     #115,R0         ;PRINT M
010144  104011                                  PRINTC
010146  005301                                  DEC     R1              ;END OF LINE
010150  001404                                  BEQ     4$              ;BRANCH IF YES
010152  004737  006576                          JSR     PC,SPC          ;SEND SPACE
010156  005301                                  DEC     R1              ;END OF LINE?
010160  001367                                  BNE     3$              ;BRANCH IF NO
010162  022703  000002                  4$:     CMP     #2,R3           ;TEST R3
010166  001003                                  BNE     6$              ;BRANCH IF NOT FIRST TIME
010170  104014                          5$:     CR                      ;SEND CR
010172  005303                                  DEC     R3              ;DECREASE LINE COUNTER
010174  000757                                  BR      2$              ;REPEAT LINE
010176  005703                          6$:     TST     R3              ;THIRD TIME?
010200  001373                                  BNE     5$              ;BRANCH IF NOT
010202  104006                                  CRLF                    ;NEXT LINE
010204  005723                                  TST     (R3)+           ;REPEAT COUNTER TO R3
010206  013701  001112                  7$:     MOV     WIDTH,R1        ;COLUMN COUNT TO R1
010212  004737  006576                  8$:     JSR     PC,SPC          ;SEND SPACE
010216  005301                                  DEC     R1              ;DECREASE COLUMN COUNT
010220  001405                                  BEQ     9$              ;BRANCH IF 0, END OF LINE
010222  012700  000100                          MOV     #100,R0         ;"@" TO R0
010226  104011                                  PRINTC                  ;SEND IT
010230  005301                                  DEC     R1              ;DECREASE COLUMN COUNT
010232  001367                                  BNE     8$              ;BRANCH IF NOT 0 (NOT END)
010234  022703  000002                  9$:     CMP     #2,R3           ;END OF LINE, FIRST TIME?
010240  001003                                  BNE     11$             ;BRANCH IF NOT
010242  104014                          10$:    CR                      ;SEND CR
010244  005303                                  DEC     R3              ;DECREASE LINE COUNTER
010246  000757                                  BR      7$              ;REPEAT LINE
010250  005703                          11$:    TST     R3              ;TEST IF THIRD REPEAT
010252  001373                                  BNE     10$             ;BRANCH IF NOT
010254  104006                                  CRLF                    ;DO NEXT LINE
010256  005723                                  TST     (R3)+           ;LINE REPEAT COUNTER TO R3
010260  013701  001112                  12$:    MOV     WIDTH,R1        ;COLUMN COUNT TO R1
010264  012700  000046                  13$:    MOV     #46,R0          ;"&" TO R0
010270  104011                                  PRINTC                  ;PRINT IT
010272  005301                                  DEC     R1              ;DECREASE COLUMN COUNT
010274  001404                                  BEQ     14$             ;BRANCH IF END
```

```
        010276  004737  006576                   JSR     PC,SPC                  ;SEND SPACE
        010302  005301                           DEC     R1                      ;DECREASE COLUMN COUNT
        010304  001367                           BNE     13$                     ;BRANCH IF NOT END
        010306  022703  000002          14$:     CMP     #2,R3                   ;TEST IF FIRST TIME
        010312  001003                           BNE     16$                     ;BRANCH IF =2, FIRST TIME
        010314  104014                  15$:     CR                              ;CARRIAGE RETURN
        010316  005303                           DEC     R3                      ;DECREASE REPEAT COUNTER
        010320  000757                           BR      12$                     ;PRINT LINE AGAIN
        010322  005703                  16$:     TST     R3                      ;TEST IF END, R3=0
        010324  001373                           BNE     15$                     ;BRANCH IF NOT END
        010326  104006                           CRLF                            ;SEND CR,LF
        010330  104001                           CHAIN                           ;CHAIN TO NEXT TEST
        010332  000676                           BR      1$                      ;REPEAT TEST
```

```
                                        ;XXXXXXXXXXX
                                        ;
                                        ;PT10-- PRINTING FREQUENCY TEST-- 120 H'S ARE PRINTED ON 4 LINES
                                        ;       30 PER LINE. THE TEST IS SUCH THAT BETWEEN THE FIRST AND SECOND
                                        ;       "H" A 30 MSEC DELAY IS INTRODUCED. THIS DELAY IS THEN INCREASED
                                        ;       BETWEEN CHARACTERS OUT TO 60 CHARACTERS IN AN EXPONENTIAL
                                        ;       MANNER. THE DELAY IS THEN DECREASED IN THE SAME MANNER OUT TO THE
                                        ;       120TH CHARACTER. THIS DELAY IS CALCULATED AS FOLLOWS:
                                        ;
                                        ;       NEW DELAY = OLD DELAY (+ OR -) (OLD DELAY/16 + OLD DELAY/128
                                        ;
                                        ;XXXXXXXXXXX

 010334  000012                          PT10:  10                                ;TEST NUMBER
 010336  010472                                 PT11                              ;NEXT TEST
 010340  104012                                 PRTHDR                            ;PRINT TEST HEADER
 010342  012701  000036                  1$:    MOV     #36,R1                    ;SET R1=30
 010346  012702  000170                         MOV     #120.,R2                  ;SET CHAR COUNT = 120
 010352  012737  000036  010370                 MOV     #30.,3$+2                 ;SET UP DELAY VALUE
 010360  012700  000110                  2$:    MOV     #110,R0                   ;"H" TO R0
 010364  104011                                 PRINTC                            ;SEND IT
 010366  012700  000036                  3$:    MOV     #30.,R0
 010372  104003                                 DELAY                             ;DELAY
 010374  005301                                 DEC     R1                        ;DEC. COUNT OF CHARS PER LINE
 010376  001426                                 BEQ     6$                        ;BRANCH IF 0, END OF LINE
 010400  005302                          4$:    DEC     R2                        ;DECREMENT CHAR COUNTER
 010402  001430                                 BEQ     7$                        ;BRANCH IF END
 010404  013704  010370                         MOV     3$+2,R4                   ;GET OLD DELAY
 010410  006204                                 ASR     R4                        ;CAL 1/16 OF OLD DELAY
 010412  006204                                 ASR     R4
 010414  006204                                 ASR     R4
 010416  006204                                 ASR     R4
 010420  010405                                 MOV     R4,R5                     ;SAVE 1/16 IN R5
 010422  006204                                 ASR     R4                        ;CAL 1/128 OF OLD DELAY
 010424  006204                                 ASR     R4
 010426  006204                                 ASR     R4
 010430  060405                                 ADD     R4,R5                     ;1/16 +1/128 TO R5
 010432  022702  000074                         CMP     #60.,R2                   ;TEST WHICH HALF OF THE 120 CHARS.
 010436  003403                                 BLE     5$                        ;BRANCH IF LT OR EQ 60
 010440  160537  010370                         SUB     R5,3$+2                   ;GT 61, DECREASE DELAY BY 34 MEC.
 010444  000745                                 BR      2$                        ;GO PRINT AGAIN
 010446  060537  010370                  5$:    ADD     R5,3$+2                   ;LT HALF WAY, ADD DELAY OF 34 MEC.
 010452  000742                                 BR      2$                        ;GO PRINT AGAIN
 010454  104006                          6$:    CRLF                              ;SEND CRLF
 010456  012701  000036                         MOV     #36,R1                    ;SET R1=30
 010462  000746                                 BR      4$
 010464  104006                          7$:    CRLF                              ;SEND CR,LF
 010466  104001                                 CHAIN                             ;CHAIN TO NEXT TEST
 010470  000724                                 BR      1$                        ;REPEAT TEST
```

C06

```
                                        ;XXXXXXXXXXX
                                        ;
                                        ;FT11-- RIBBON FEED TEST -- THIS TEST PRINTS A SINGLE COLUMN
                                        ;       OF X'S (24 LINES) DOWN THE LEFT MARGIN OF THE PAGE.  VISUALLY
                                        ;       CHECK THE RIBBON REED MECHANISM FOR PROPER OPERATION.
                                        ;
                                        ;XXXXXXXXXXX

        010472  000011                  FT11:   11                              ;TEST NUMBER
        010474  010524                          PT12                            ;NEXT TEST
        010476  104012                          PRTHDR                          ;PRINT TEST HEADER
        010500  012701  000030          1$:     MOV     #30,R1                  ;SET R1=24
        010504  012700  000130          2$:     MOV     #130,R0                 ;SET CHAR = X
        010510  104011                          PRINTC                          ;PRINT X
        010512  104006                          CRLF                            ;SEND CR-LF
        010514  005301                          DEC     R1                      ;DEC COUNT
        010516  001372                          BNE     2$                      ;BRANCH IF NOT DONE TEST
        010520  [illegible]                     CHAIN                           ;CHAIN TO NEXT TEST
        010522  000766                          BR      1$                      ;REPEAT TEST

                                        ;XXXXXXXXXXX
                                        ;
                                        ;FT12--  PRINTER BELL TEST-- THE LAST TEST IN THE
                                        ;        PRINTER TEST SEQUENCE.  THIS TEST OUTPUTS
                                        ;        EIGHT BELL SIGNALS TO THE PRINTER
                                        ;
                                        ;XXXXXXXXXXX

        010524  000012                  FT12:   12                              ;THIS TEST
        010526  005410                          PT0                             ;NEXT TEST
        010530  104012                          PRTHDR                          ;PRINT TEST HEADER
        010532  012701  000010          FT12A:  MOV     #10,R1                  ;COUNTER TO R1
        010536  012700  000007          1$:     MOV     #7,R0                   ;BELL TO R0
        010542  104011                          PRINTC                          ;SEND IT
        010544  005301                          DEC     R1                      ;DECREMENT COUNT
        010546  001373                          BNE     1$                      ;BRANCH IF NOT ZERO
        010550  104010                          LF                              ;SEND LF
        010552  012700  003720                  MOV     #3720,R0                ;DELAY 2 SEC BEFORE RESTARTING
        010556  104003                          DELAY

        010560  013700  000042                  MOV     @#42,R0                 ;CHECK IF UNDER ACT11 OR XXDP
        010564  001405                          BEQ     HERE                    ;CONTINUE TEST SEQUENCE
        010566  000005                          RESET
        010570  004710                  LOGICAL:JSR     PC,R0
        010572  000240                          NOP
        010574  000240                          NOP
        010576  000240                          NOP
        010600  [illegible]             HERE:   CHAIN                           ;CHAIN TO NEXT TEST
        010602  000753                          BR      FT12A                   ;REPEAT TEST
```

```
                                        ;XXXXXXXXXXX
                                        ;
                                        ;PT17--LIFE TEST
                                        ;       THIS TEST PRINTS 2 FULL LINES OF EACH PRINTABLE
                                        ;       CHARACTER AND OVERPRINTS THE SECOND LINE 4 TIMES.
                                        ;       THIS TEST IS CONTINUOUS RUNNING ONCE INITIATED.
                                        ;       LOOPING AUTOMATICALLY ON ITSELF.
                                        ;       END OF PASS COUNT IS CLEARED WHENEVER THE TEST IS RESTARTED.
                                        ;
                                        ;XXXXXXXXXXX

010604  000017                          PT17B:  17                      ;TEST NUMBER
010606  010604                                  PT17B                   ;NEXT TEST
010610  000137  010626                          JMP     PT17D           ;CONTINUE
010614  000017                          PT17:   17                      ;TEST NUMBER
010616  010604                                  PT17B                   ;NEXT TEST
010620  005037  010754                          CLR     PASCNT          ;CLEAR PASS COUNT
010624  104012                                  PRTHDR                  ;PRINT TEST HEADER
010626  012737  000041  001114          PT17D:  MOV     #41,REPT        ;SET START CHAR
010634  013701  001116                  1$:     MOV     WIDTH,R1        ;SET COLUMN COUNT
010640  013700  001114                  2$:     MOV     REPT,R0         ;GET CHAR
010644  104011                                  PRINTC                  ;SEND CHAR
010646  005301                                  DEC     R1              ;DECREMENT COUNT
010650  001373                                  BNE     2$              ;BRANCH IF NOT DONE
010652  104006                                  CRLF                    ;SEND CR-LF
010654  012702  000005                          MOV     #5,R2           ;SET OVERPRINT COUNT
010660  013701  001116                  3$:     MOV     WIDTH,R1        ;SET COLUMN COUNT
010664  013700  001114                  4$:     MOV     REPT,R0         ;GET CHAR
010670  104011                                  PRINTC                  ;SEND CHAR
010672  005301                                  DEC     R1              ;DECREMENT COUNT
010674  001373                                  BNE     4$              ;BRANCH IF NOT DONE
010676  104014                                  CR                      ;SEND CR
010700  005302                                  DEC     R2              ;DONE OVERPRINTS?
010702  001366                                  BNE     3$              ;NO, CONTINUE
010704  104010                                  LF                      ;SEND LF
010706  005237  001114                          INC     REPT            ;SET NEXT CHAR
010712  022737  000177  001114                  CMP     #177,REPT       ;DONE CHAR SET?
010720  001345                                  BNE     1$              ;NO, CONTINUE
010722  005237  010754                          INC     PASCNT          ;INCREMENT PASS COUNT
010726  012700  016746                          MOV     #PASMES,R0      ;SET MESSAGE ADDRESS
010732  013701  010754                          MOV     PASCNT,R1       ;# TO CONVERT
010736  012702  000004                          MOV     #4,R2           ;# DIGITS
010742  104015                                  BTOASC                  ;CONVERT PASS COUNT TO ASCII
010744  104003                                  TYPEM                   ;TYPE PASS COUNT
010746  016727                                  ENDPAS
010750  104001                                  CHAIN                   ;REPEAT TEST
010752  000726                                  BR      PT17D

010754  000000                          PASCNT: 0
```

```
                                        .SBTTL  ECHO TESTS




                                ;XXXXXXXXXX
                                ;
                                ;EC20-- CHARACTER ECHO TEST-- ALL PRINTABLE AND
                                ;       NON-PRINTING CHARACTERS TYPED ON THE KEYBOARD
                                ;       ARE USED TO DRIVE THE PRINTER, ONE CHARACTER AT
                                ;       A TIME.  A "RUBOUT" WILL CAUSE THE TEST TO BE
                                ;       TERMINATED.
                                ;
                                ;XXXXXXXXXXXX

 010756  000020                  EC20:   20                      ;TEST NUMBER
 010760  011022                          EC21                    ;NEXT TEST
 010762  104012                          PRTHDR                  ;PRINT TEST HEADER
 010764  104013                  1$:     READ                    ;GO WAIT FOR KEYBOARD INPUT
 010766  012700  000036                  MOV     #30.,R0         ;DELAY FOR HALF DUPLEX
 010772  104003                          DELAY
 010774  013700  001124                  MOV     TEMPCH,R0       ;GET CHAR
 011000  022700  000177                  CMP     #177,R0         ;CHECK IF RUBOUT
 011004  001402                          BEQ     2$              ;BRANCH IF YES
 011006  104021                          ECHO                    ;NO, CHECK PRINTER READY
 [illegible] [illegible]                 BR      1$
 [illegible] [illegible]         2$:     TYPEM                   ;PRINT TERMINATION MESSAGE
 [illegible] [illegible]                 ECOEND
 [illegible] [illegible]                 CHAIN                   ;CHAIN TO NEXT TEST
 [illegible] [illegible]                 BR      1$              ;REPEAT TEST
```

```
                                        ;XXXXXXXXXXX
                                        ;
                                        ;E021-- LINE ECHO TEST, FAST RATE-- THIS TEST WILL
                                        ;       CAUSE THE CONTINUAL PRINTING OF "0" AT THE MAXIMUM
                                        ;       RATE UNTIL EITHER ANOTHER CHARACTER IS SELECTED
                                        ;       BY PRESSING A KEY ON THE KEYBOARD OR TERMINATION B. THE
                                        ;       RUBOUT.
                                        ;
                                        ;XXXXXXXXXXX

        011022  000021                  E021:   21                      ;TEST NUMBER
        011024  011074                          E022                    ;NEXT TEST
        011026  104012                          PRTHDR                  ;PRINT TEST HEADER
        011030  012737  000060  001114  E021A:  MOV     #60,REPT        ;CHARACTER TO BE REPEATED (0)
        011036  013737  001116  001122  2$:     MOV     WIDTH,POSI      ;SET CHAR COUNT
        011044  013700  001114          1$:     MOV     REPT,R0         ;CHAR TO TEMPCH
        011050  104011                          PRINTC                  ;PRINT CHAR
        011052  005337  001122                  DEC     POSI            ;DECREMENT POSITION COUNTER
        011056  001372                          BNE     1$              ;CONTINUE
        011060  104006                          CRLF                    ;SEND A CR AND LF
        011062  000765                          BR      2$

        011064  104003                  E021B:  TYPEM                   ;PRINT TERMINATION MESG
        011066  012710                          ECCEND
        011070  104017                          CHAIN                   ;CHAIN TO NEXT TEST
        011072  000756                          BR      E021A           ;REPEAT TEST
```

G06

```
                                        ;XXXXXXXXXXX
                                        ;
                                        ;E022-- LINE ECHO TEST, SLOW RATE-- SAME AS E021 EXCEPT
                                        ;       THAT A DELAY IS INTRODUCED BETWEEN CHARACTERS
                                        ;       TO PRODUCE AN LOV ACTION
                                        ;
                                        ;XXXXXXXXXXX

011074  000022                          E022:   22
011076  011360                                  E023
011100  104016                                  PRTHDR                  ;PRINT TEST HEADER
011102  012737  000060  001114          E022A:  MOV     #60,REPT        ;LOAD 0 AS INITIAL CHARACTER
011110  013737  001112  001122          3$:     MOV     WIDTH,POSI      ;SET CHAR COUNT
011116  013700  001114                  1$:     MOV     REPT,R0         ;READY CHAR TO TEMPCH
011122  104011                                  PRINTC                  ;OUTPUT CHAR
011124  012700  003410                          MOV     #3410,R0
011130  104003                                  DELAY
011132  005337  001122                          DEC     POSI            ;DECREMENT POSITION COUNTER
011136  001367                                  BNE     1$              ;BRANCH IF NOT DONE LINE
011140  104006                          2$:     CRLF                    ;SEND A CR AND LF
011142  000762                                  BR      3$

011144  104005                          E022B:  TYPEM                   ;PRINT TERMINATION MESSAGE
011146  011310                                  ECOEND
011150  104007                                  CHAIN                   ;CHAIN TO NEXT TEST
011152  000753                                  BR      E022A           ;REPEAT TEST
```

```
                                        ;********
                                        ;
                                        ;       THIS FOLLOWING TABLE IS USED BY TFST E023
                                        ;
                                        ;********

011154  052516  020114                  MONIC:  .ASCII  /NUL /
011160  047523  020110                          .ASCII  /SOH /
011164  052123  020130                          .ASCII  /STX /
011170  052105  020130                          .ASCII  /ETX /
011174  047505  020124                          .ASCII  /EOT /
011200  047105  020121                          .ASCII  /ENQ /
011204  041501  020113                          .ASCII  /ACK /
011210  042502  020114                          .ASCII  /BEL /
011214  051502  020040                          .ASCII  /BS  /
011220  052110  020040                          .ASCII  /HT  /
011224  043114  020040                          .ASCII  /LF  /
011230  052126  020040                          .ASCII  /VT  /
011234  043106  020040                          .ASCII  /FF  /
011240  051103  020040                          .ASCII  /CR  /
011244  047523  020040                          .ASCII  /SO  /
011250  044523  020040                          .ASCII  /SI  /
011254  046104  020105                          .ASCII  /DLE /
011260  041504  020061                          .ASCII  /DC1 /
011264  041504  020062                          .ASCII  /DC2 /
011270  041504  020063                          .ASCII  /DC3 /
011274  041504  020064                          .ASCII  /DC4 /
011300  040516  020113                          .ASCII  /NAK /
011304  054523  020116                          .ASCII  /SYN /
011310  052105  020102                          .ASCII  /ETB /
011314  040503  020116                          .ASCII  /CAN /
011320  046505  020040                          .ASCII  /EM  /
011324  052523  020102                          .ASCII  /SUB /
011330  051505  020103                          .ASCII  /ESC /
011334  051506  020040                          .ASCII  /FS  /
011340  051507  020040                          .ASCII  /GS  /
011344  051522  020040                          .ASCII  /RS  /
011350  051525  020040                          .ASCII  /US  /
011354  050123  020040                          .ASCII  /SP  /

                                                .EVEN
                                                ;XXXXXXXXXX
                                                ;
                                                ;E023--  CHARACTER CODE TEST-- ALL CHARACTERS SELECTED
                                                ;        WILL BE ECHOED ALONG WITH ITS OCTAL CODE.
                                                ;        A MNEMONIC WILL BE PRINTED INSTEAD OF THE CHARACTER
                                                ;        IF IT IS A NON-PRINTING CHARACTER.
                                                ;        THE PARITY OF THE RECEIVED CODE WILL BE
                                                ;        INDICATED AS EITHER EVEN OR ODD.
                                                ;
                                                ;XXXXXXXXXX

011360  000023                                  E023:   23                              ;TEST NUMBER
011362  011702                                          E024                            ;NEXT TEST
011364  104012                                          PRTHDR                          ;PRINT TEST HEADER
011366  104013                                  1$:     READ                            ;GO WAIT FOR CHARACTER
011370  012700  000036                                  MOV     #30.,R0                 ;DELAY FOR HALF DUPLEX
011374  104003                                          DELAY
011376  023727  001124  000041                          CMP     TEMPCH,#41              ;TEST IF CHAR IS PRINTABLE
011404  103015                                          BHIS    3$                      ;BRANCH IF IT IS
011406  004737  011542                                  JSR     PC,STRLN                ;STORE CODE INTO MESSAGE
011412  013700  001124                                  MOV     TEMPCH,R0               ;GET CODE AGAIN
011416  006300                                          ASL     R0                      ;MULT BY 2
011420  006300                                          ASL     R0                      ;MULT BY 4
011422  062700  011154                                  ADD     #MONIC,R0               ;ADD ADDR OF MNEMONIC TABLE
011426  004737  011620                                  JSR     PC,MOVNUM               ;MOV MNEMONIC TO MESSAGE
011432  104000                                  2$:     TYPE                            ;TYPE CODE AND MNEMONIC
011434  017237                                          E023M                           ;ADDRESS OF MESSAGE
011436  000753                                          BR      1$                      ;GO WAIT FOR NEXT CHARACTER
011440  023727  001124  000177                  3$:     CMP     TEMPCH,#177             ;TEST IF CHAR IS A RUBOUT
011446  001421                                          BEQ     4$                      ;BRANCH IF RUBOUT
011450  012701  011672                                  MOV     #MG24,R1
011454  113721  001124                                  MOVB    TEMPCH,(R1)+
011460  112721  000040                                  MOVB    #40,(R1)+
011464  112721  000040                                  MOVB    #40,(R1)+
011470  112721  000040                                  MOVB    #40,(R1)+
011474  004737  011542                                  JSR     PC,STRLN                ;STORE CODE INTO MESSAGE
011500  012700  011672                                  MOV     #MG24,R0                ;ADDR OF CHAR INTO R0
011504  004737  011620                                  JSR     PC,MOVNUM               ;MOVE CHAR INTO MESSAGE
011510  000750                                          BR      2$                      ;TYPE MESSAGE
011512  004737  011542                          4$:     JSR     PC,STRLN                ;RUBOUT, CONVERT AND STOR CODE
011516  012700  011676                                  MOV     #MG25,R0                ;ADDR. OF DEL INTO R0
011522  004737  011620                                  JSR     PC,MOVNUM               ;MOVE DEL INTO MESSAGE
011526  104000                                          TYPE                            ;TYPE MESSAGE
011530  017237                                          E023M                           ;ADDR OF MESSAGE
011532  104002                                          TYPEM
011534  017210                                          ECOEND
011536  104001                                          CHAIN                           ;CHAIN TO NEXT TEST
011540  000712                                          BR      1$                      ;REPEAT TEST
```

```
011542  012702  000003      STRLN:  MOV     #3,R2           ;COUNT OF 3 TO R2
011546  012701  017241              MOV     #LINES,R1       ;ADDR OF MESG TO R1
011552  062701  000003              ADD     #3,R1           ;POINT TO LAST SPACE IN MESG
011556  013700  001130      1$:     MOV     PCHAR,R0        ;MOVE OCTAL CODE TO R0
011562  042700  177770              BIC     #177770,R0      ;SAVE LS OCTAL CHAR.
011566  062700  000060              ADD     #60,R0          ;MAKE ASCII
011572  110041                      MOVB    R0,-(R1)        ;MOVE INTO MESG
011574  005302                      DEC     R2              ;DECREMENT CHAR COUNTER
011576  001407                      BEQ     2$              ;BRANCH IF 3 MOVED
011600  006237  001130              ASR     PCHAR           ;NOT THREE, SHIFT NEXT OCTAL
011604  006237  001130              ASR     PCHAR           ;CHARACTER TO THE RIGHT
011610  006237  001130              ASR     PCHAR           ;
011614  000760                      BR      1$              ;CONVERT AND STORE NEXT CHAR.
011616  000207              2$:     RTS     PC              ;RETURN TO CALLER


011620  012701  017245      MOVNUM: MOV     #LINESA,R1      ;ADDR OF LINES IN R1
011624  012702  000004              MOV     #4,R2           ;COUNT OF 3 TO R2
011630  112021              1$:     MOVB    (R0)+,(R1)+     ;MOV 3 CHARS TO MESG AREA
011632  005302                      DEC     R2              ;DECREMENT COUNTER
011634  001375                      BNE     1$              ;BRANCH IF NOT ALL DONE
011636  105737  001126              TSTB    PARITY          ;TEST PARITY FLAG
011642  001003                      BNE     2$              ;BRANCH IF ODD PARITY
011644  012700  017302              MOV     #EVEN,R0        ;SET MESSAGE FOR EVEN PARITY
011650  000402                      BR      3$              ;CONTINUE
011652  012700  017306      2$:     MOV     #ODD,R0         ;SET MESSAGE FOR ODD PARITY
011656  012702  000004      3$:     MOV     #4,R2           ;SET WORD COUNT
011662  112021              4$:     MOVB    (R0)+,(R1)+     ;MOVE CHAR TO MESSAGE
011664  005302                      DEC     R2              ;DEC CHAR COUNT
011666  001375                      BNE     4$              ;CONTINUE
011670  000207                      RTS     PC              ;RETURN

011672  020040  020040      MG24:   .ASCII  /    /          ;SAVE CHARACTER CODE

                                    .EVEN

011676  042504  020114      MG25:   .ASCII  /DEL            ;MNEMONIC FOR RUBOUT

                                    .EVEN
```

```
                                        ;XXXXXXXXXX
                                        ;
                                        ;E024--  SELECTED PATTERN ECHO TEST-- SELECT 1 TO 256
                                        ;        CHARACTERS.  EACH WILL BE ECHOED
                                        ;        AND STORED UNTIL THE CNTL/C IS SELECTED.
                                        ;        AT THAT TIME ALL CHARACTERS WILL BE PRINTED AS
                                        ;        A CONTINOUS STRING UNTIL EITHER THE RUBOUT IS
                                        ;        SELECTED TO TERMINATE OR THE CNTL/C IS SELECTED
                                        ;        AGAIN.  A TERMINATING CNTL/C FOLLOWED BY A CNTL/C WILL ALWAYS
                                        ;        CAUSE THE LAST INPUTTED STRING TO BE REPEATED. A TERMINATING
                                        ;        CNTL/C FOLLOWED BY SOME OTHER CHARACTER WILL START A NEW
                                        ;        STRING.
                                        ;
                                        ;XXXXXXXXXXX

 011702  000024                         E024:   24                      ;TEST NUMBER
 011704  012466                                 E025                    ;NEXT TEST
 011706  104012                                 PRTHDR                  ;PRINT TEST HEADER
 011710  005001                         E024B:  CLR     R1              ;CLEAR CHARACTER COUNT
 011712  012702  012064                         MOV     #BUFR,R2        ;ADDRESS OF BUFFER TO R2
 011716  104013                         1$:     READ                    ;WAIT FOR INPUT
 011720  012700  000036                         MOV     #30.,R0         ;DELAY FOR HALF DUPLEX
 011724  104003                                 DELAY
 011726  022737  000177  001124                 CMP     #177,TEMPCH     ;TEST IF RUBOUT
 011734  001447                                 BEQ     TERM            ;BRANCH IF RUBOUT
 011736  022737  000003  001124                 CMP     #3,TEMPCH       ;TEST IF .CNTL-C
 011744  001416                                 BEQ     OUTPUT          ;BRANCH IF CNTL-C
 011746  020127  000400                         CMP     R1,#256.        ;YES, CHECK IF CHAR CNT IS EQ, GT 256
 011752  103361                                 BHIS    1$              ;BRANCH IF YES, IGNORE CHAR
 011754  013700  001124                         MOV     TEMPCH,R0       ;GET CHAR
 011760  110022                                 MOVB    R0,(R2)+        ;STORE CHAR INTO BUFFER
 011762  005201                                 INC     R1              ;INCREMENT CHARACTER COUNT
 011764  104021                                 ECHO                    ;OUTPUT CHAR
 011766  000753                                 BR      1$              ;GO WAIT FOR NEXT CHAR

 011770  005037  001124                 E024R:  CLR     TEMPCH          ;CLEAR CONTROL-C FROM BUFFER
 011774  104006                                 CRLF                    ;CONTROL-C RETURN FROM PRINT ROUTINE
 011776  104010                                 LF
 012000  000743                                 BR      E024B
```

```
                                  ;********
                                  ;
                                  ;SECTION TO OUTPUT CONTINOUS STRING
                                  ;
                                  ;********

012002  020227  012064            OUTPUT: CMP     R2,#BUFR          ;CHECK IF POINTER IS AT START OF BUFFER
012006  001405                            BEQ     1$                ;YES, DON'T STORE ↑C IN TABLE
012010  113722  001124                    MOVB    TEMPCH,(R2)+      ;STORE ↑C IN TABLE
012014  005037  001124                    CLR     TEMPCH            ;CLEAR CONTROL-C FROM BUFFER
012020  104006                            CRLF                      ;SEND A CR LF
012022  012702  012064            1$:     MOV     #BUFR,R2          ;BUFFER ADDRESS TO R2
012026  005037  001124                    CLR     TEMPCH            ;CLEAR CONTROL-C
012032  121227  000003                    CMPB    (R2),#3           ;FIRST CHAR IN TABLE ↑C ?
012036  001724                            BEQ     E024B             ;YES, GO LOOK FOR MORE INPUT
012040  112200                    2$:     MOVB    (R2)+,R0          ;GET CHAR
012042  020027  000003                    CMP     R0,#3             ;DONE STRING?
012046  001765                            BEQ     1$                ;YES, RESTART STRING
012050  104011                            PRINTC                    ;OUTPUT CHAR
012052  000772                            BR      2$

012054  104002                    TERM:   TYPEM                     ;OUTPUT TERMINATION MESSAGE
012056  017210                            ECOEND
012060  104001                            CHAIN                     ;CHAIN TO NEXT TEST
012062  000712                            BR      E024B             ;REPEAT TEST

012064  000003                    BUFR:   3                         ;INITIALIZE FIRST CHAR AS CNTL-C IN TALBE
012066  000400                            .BLKB   256.              ;256 CHARACTER BUFFER
```

```
                                        ;XXXXXXXXXXX
                                        ;
                                        ;E025--  BELL ECHO TEST-- A MESSAGE IS PRINTED AND
                                        ;        THE TEST WAITS FOR SOME PRINTABLE CHARACTER
                                        ;        TO BE SELECTED ON THE KEYBOARD (GT040).  THIS
                                        ;        TEST IS VALID ONLY IF THE PAPER WIDTH IS GT 64
                                        ;        COLUMNS.  IF LT64 COLUMNS AN ILLEGAL BELL TEST
                                        ;        MESSAGE IS PRINTED.
                                        ;
                                        ;XXXXXXXXXXX

012466  000025                          E025:   25                              ;TEST NUMBER
012470  010756                                  E020                            ;NEXT TEST HEADER
012472  104012                                  PRTHDR                          ;PRINT TEST HEADER
012474  023727  001112  000101          1$:     CMP     WIDTH,#101              ;TEST IF COLUMN COUNTIS EQ.GT 64
012502  103424                                  BLO     4$                      ;BRANCH IF NOT
012504  104002                                  TYPEM                           ;TYPE TEST MESG
012506  017063                                  E025MA                          ;ON ALL TERM'S
012510  000402                                  BR      3$                      ;WAIT FOR CHAR
012512  104000                          2$:     TYPE                            ;TYPE TEST MESG ON TERM
012514  017063                                  E025MA                          ;CHARACTER WAS RECEIVED ON
012516  104013                          3$:     READ                            ;WAIT FOR OPERATOR RESPONSE
012520  012700  000036                          MOV     #30.,R0                 ;DELAY FOR HALF DUPLEX
012524  104003                                  DELAY
012526  113700  001124                          MOVB    TEMPCH,R0               ;CHAR TO R0
012532  020027  000040                          CMP     R0,#40                  ;TEST IF PRINTABLE
012536  103767                                  BLO     3$                      ;BRANCH IF NON-PRINTABLE
012540  022700  000177                          CMP     #177,R0                 ;CHECK IF CHAR IS RUBOUT
012544  001405                                  BEQ     5$                      ;BRANCH IF YES
012546  104021                                  ECHO                            ;PRINT CHAR
012550  104007                                  SCRLF                           ;SEND A CRLF
012552  000757                                  BR      2$                      ;REPEAT
012554  104002                          4$:     TYPEM                           ;TYPE ERROR MESSAGE
012556  017163                                  E025MB
012560  104002                          5$:     TYPEM                           ;PRINT TERMINATION
012562  017210                                  ECOEND
012564  104001                                  CHAIN                           ;EXIT TO NEXT TEST
012566  000742                                  BR      1$                      ;REPEAT TEST
```

```
                                                .SBTTL  OPTION TESTS

                                        ;XXXXXXXXXXXXXXXX
                                        ;
                                        ;TEST30 -       SECONDARY CHARACTER SET OPTION
                                        ;
                                        ;XXXXXXXXXXXXXXXX

012570  000030                          TEST30: 30
012572  012570                                  TEST30
012574  104012                                  PRTHDR                  ;PRINT TEST HEADER
012576  012704  000010                          MOV     #8.,R4          ;SET PASS COUNT
012602  104002  012666                  2$:     TYPEM,  10$             ;INDICATE PRIMARY SET AND SEND "SI"
012606  012702  000177                          MOV     #177,R2         ;SET END CHAR
012612  004737  012700                          JSR     PC,30$          ;PRINT CHAR SET
012616  104002  012673                          TYPEM,  20$             ;INDICATE SECONDARY CHAR SET
012622  013702  012750                          MOV     T30SC,R2                ;SET CHAR SET LIMIT
012626  020227  000377                          CMP     R2,#377         ;USING 8 BITS INSTEAD OF SI?
012632  001403                                  BEQ     3$              ;BRANCH IF YES
012634  012700  000016                          MOV     #16,R0          ;SET SO CHAR
012640  104011                                  PRINTC                  ;SEND IT
012642  004737  012700                  3$:     JSR     PC,30$          ;PRINT CHAR SET
012646  104006                                  CRLF                    ;BLANK LINE
012650  005304                                  DEC     R4              ;DEC PASS COUNT
012652  001353                                  BNE     2$              ;FINISH TEST
012654  012700  000017                          MOV     #17,R0          ;SET SI CHAR AGAIN
012660  104011                                  PRINTC                  ;MAKE SURE ON PRIMARY CHAR SET
012662  104001                                  CHAIN                   ;NEXT TEST SELECTION OR LOOP
012664  000741                                  BR      TEST30          ;LOOP ON TEST

012666  021417  036461     000          10$:    .ASCIZ  <17>/#1=/
012673     017  031043  000075          20$:    .ASCIZ  <17>/#2=/
                                                .EVEN

012700  010201                          30$:    MOV     R2,R1           ;GET LIMIT CHAR
012702  042701  177537                          BIC     #177537,R1      ;GET START CHAR
012706  013703  001112                          MOV     WIDTH,R3        ;GET COLUMN COUNT
012712  162703  000003                          SUB     #3,R3           ;SUBTRACT 3
012716  010100                          31$:    MOV     R1,R0           ;GET CHAR
012720  104011                                  PRINTC                  ;PRINT IT
012722  005201                                  INC     R1              ;NEXT CHAR
012724  020102                                  CMP     R1,R2           ;DONE CHAR SET?
012726  001406                                  BEQ     32$             ;EXIT IF DONE
012730  005303                                  DEC     R3              ;DEC COLUMN COUNT
012732  001371                                  BNE     31$             ;FINISH LINE
012734  104006                                  CRLF                    ;SEND CR-LF WHEN DONE LINE
012736  013703  001112                          MOV     WIDTH,R3        ;RESET COLUMN COUNT
012742  000765                                  BR      31$             ;CONTINUE
012744  104006                          32$:    CRLF                    ;SEND CR-LF
012746  000207                                  RTS     PC              ;RETURN

012750  000177                          T30SC:  .WORD   177             ;CHAR SET LIMIT
                                                                        ;CHANGE TO 377 WHEN USING 8 BIT CHAR SELECTION
```

```
2226                                            ;XXXXXXXXXXXXXXXXXX
2227                                            ;
2228                                            ;TEST31 -       SELECTIVE ADDRESSING OPTION
2229                                            ;
2230                                            ;XXXXXXXXXXXXXXXXXX
2231
2232    012752  000031                          TEST31: 31
2233    012754  012752                                  TEST31
2234    012756  104006                                  CRLF                            ;SEND CRLF
2235    012760  013700  013542                          MOV     34$,R0                  ;SET EOT CHAR
2236    012764  104011                                  PRINTC                          ;SEND IT
2237    012766  104002  013372                          TYPEM,  10$                     ;TRY PRINTING ERROR MESG
2238    012772  012700  000007                          MOV     #7,R0                   ;SET BEL CHAR
2239    012776  104011                                  PRINTC                          ;SEND IT
2240    013000  012700  000002                          MOV     #2,R0                   ;SET STX CHAR
2241    013004  104011                                  PRINTC                          ;SEND IT
2242    013006  104012                                  PRTHDR                          ;PRINT TEST HEADER ON ALL TERMINALS
2243    013010  013700  013542                          MOV     34$,R0                  ;SET EOT CODE
2244    013014  104011                                  PRINTC                          ;SEND IT
2245    013016  012700  000002                          MOV     #2,R0                   ;SET STX CODE
2246    013022  104011                                  PRINTC                          ;SEND IT
2247    013024  104002  013372                          TYPEM,  10$                     ;TRY PRINT ERROR MESG
2248    013030  012703  013520                          MOV     #30$,R3                 ;SET TABLE POINTER
2249    013034  005713                          1$:     TST     (R3)                    ;CHECK TABLE POINTER
2250    013036  001416                                  BEQ     2$                      ;NEXT PORTION OF TEST IF DONE
2251    013040  013700  013542                          MOV     34$,R0                  ;SEND EOT CHAR
2252    013044  104011                                  PRINTC
2253    013046  011300                                  MOV     (R3),R0                 ;SEND GROUP SELECT CHAR
2254    013050  104011                                  PRINTC                          ;SEND IT
2255    013052  012700  000002                          MOV     #2,R0                   ;SEND STX CHAR
2256    013056  104011                                  PRINTC
2257    013060  104002  013436                          TYPEM,  14$                     ;TYPE MESG
2258    013064  012300                                  MOV     (R3)+,R0                ;TYPE SELECT CHAR FOR MESG
2259    013066  104011                                  PRINTC
2260    013070  104006                                  CRLF                            ;CR-LF
2261    013072  000760                                  BR      1$                      ;CONTINUE - NEXT SELECT CHAR
2262    013074  012703  013546                  2$:     MOV     #40$,R3                 ;SET TABLE ADR
2263    013100  005713                          3$:     TST     (R3)                    ;CHECK SELECT CHAR
2264    013102  001517                                  BEQ     4$                      ;CONTINUE TEST
2265    013104  013700  013542                          MOV     34$,R0                  ;SEND EOT CHAR
2266    013110  104011                                  PRINTC                          ;ALL TERMS OFF
2267    013112  011300                                  MOV     (R3),R0                 ;GET UNIQUE SELECT CHAR
2268    013114  104011                                  PRINTC                          ;SEND IT - THAT TERM ON
2269    013116  104002  013372                          TYPEM,  10$                     ;TRY PRINTNG ERROR MESG
2270    013122  012700  000002                          MOV     #2,R0                   ;SEND STX
2271    013126  104011                                  PRINTC
2272    013130  104002  013444                          TYPEM,  15$                     ;TYPE SELECT CHAR MESG
2273    013134  011300                                  MOV     (R3),R0                 ;PRINT SELECT CHAR FOR MESG
2274    013136  104011                                  PRINTC
2275    013140  104006                                  CRLF
2276    013142  104002  013463                          TYPEM,  20$                     ;PRINT MESG
2277    013146  104013                                  READ                            ;READ CHAR FROM SELECTED TERM
2278    013150  012700  000036                          MOV     #30.,R0                 ;DELAY FOR HALF DUPLEX
2279    013154  104003                                  DELAY
```

```
013156  022737  000177  001124          CMP     #177,TEMPCH         ;CHECK CHAR
013164  001013                          BNE     5$                  ;EXIT IF RUBOUT
013166  013700  013542                  MOV     34$,R0              ;ENABLE ALL TERMINALS
013172  104011                          PRINTC
013174  012700  000007                  MOV     #7,R0
013200  104011                          PRINTC
013202  012700  000002                  MOV     #2,R0
013206  104011                          PRINTC
013210  000137  002450                  JMP     TTY1H               ;GO TO KYBD CONTROL
013214  013700  001124          5$:     MOV     TEMPCH,R0           ;GET CHAR
013220  104021                          ECHO                        ;ECHO CHAR
013222  104006                          CRLF                        ;SEND CR-LF
013224  013700  013542                  MOV     34$,R0              ;SEND EOT CHAR
013230  104011                          PRINTC
013232  013700  013544                  MOV     35$,R0              ;SEND DUMMY SELECT CHAR
013236  104011                          PRINTC
013240  012700  000002                  MOV     #2,R0               ;SEND STX
013244  104011                          PRINTC
013246  104002  013372                  TYPEM,  10$                 ;TRY PRINTING ERROR MESSAGE
013252  012700  000003                  MOV     #3,R0               ;SEND ETX
013256  104011                          PRINTC
013260  011300                          MOV     (R3),R0             ;SEND UNIQUE SELECT CHAR
013262  104011                          PRINTC
013264  012700  000002                  MOV     #2,R0               ;SEND STX
013270  104011                          PRINTC
013272  104002  013444                  TYPEM,  15$                 ;PRINT SELECT MESG ON SELECTED TERMINAL
013276  011300                          MOV     (R3),R0             ;PRINT SELECT CHAR FOR MESG
013300  104011                          PRINTC
013302  104006                          CRLF                        ;SEND CR-LF
013304  012700  000003                  MOV     #3,R0               ;SEND ETX
013310  104011                          PRINTC
013312  012700  013544                  MOV     #35$,R0             ;SEND DUMMY SELECT CHAR
013316  104011                          PRINTC
013320  012700  000002                  MOV     #2,R0               ;SEND STX
013324  104011                          PRINTC
013326  104002  013444                  TYPEM,  15$                 ;PRINT MESG ON SELECTED TERM
013332  012300                          MOV     (R3)+,R0            ;PRINT SELECT CHAR FOR MESG
013334  104011                          PRINTC
013336  104006                          CRLF                        ;SEND CR-LF
013340  000657                          BR      3$                  ;CONTINUE
013342  013700  013542          4$:     MOV     34$,R0              ;ENABLE ALL LINES
013346  104011                          PRINTC                      ;BEFORE EXITING TEST
013350  012700  000007                  MOV     #7,R0
013354  104011                          PRINTC
013356  012700  000002                  MOV     #2,R0
013362  104011                          PRINTC
013364  104001                          CHAIN                       ;CHAIN TO NEXT TEST OR LOOP ON TEST
013366  000137  012752                  JMP     TEST31              ;LOOP ON TEST
```

```
013372  051105  047522  026122  10$:    .ASCIZ  ERROR, ALL TERMINALS SHOULD BE OFF/<CRLF>
013400  040440  046114  052040
013406  051105  044515  040516
013414  051514  051440  047510
013422  046125  020104  042502
013430  047440  043106  000200
013436  051107  052517  020120  14$:    .ASCII  GROUP
013444  042523  042514  052103  15$:    .ASCIZ  SELECT CHAR =
013452  041440  040510  020122
013460  020075     000
013463     124  050131  020105  20$:    .ASCIZ  TYPE ANY PRINTABLE CHAR ...
013470  047101  020131  051120
013476  047111  040524  046102
013504  020105  044103  051101
013512  027040  027056  000040
                                        .EVEN

013520  000107                  30$:    107                     ;GROUP SELECT CHAR TABLE
013522  000000                          0                       ;FIRST ZERO = END OF TABLE
013524  000000                          0
013526  000000                          0
013530  000000                          0
013532  000000                          0
013534  000000                          0
013536  000000                          0
013540  000000                          0

013542  000004                  34$:    004                     ;DESELECT CHAR = "EOT"

013544  000045                  35$:    045                     ;DUMMY SELECT CHARACTER,
                                                                ;IF "%" IS USED AS A UNIQUE OR GROUP SELECT
                                                                ;CHARACTER, REPLACE WITH ANY UNUSED SELECT
                                                                ;CHARACTER CODE.

013546  000125                  40$:    125                     ;UNIQUE SELECT CHAR TABLE
013550  000000                          0                       ;FIRST ZERO = END OF TABLE
013552  000000                          0
013554  000000                          0
013556  000000                          0
013560  000000                          0
013562  000000                          0
013564  000000                          0
013566  000000                          0
```

```
                                        ;XXXXXXXXXXXXXXXX
                                        ;
                                        ;TEST32 -       AUTO ANSWER BACK OPTION
                                        ;
                                        ;XXXXXXXXXXXXXXXX

013570  000032                          TEST32: 32
013572  013570                                  TEST32
013574  104012                                  PRTHDR                  ;PRINT TEST HEADER
013576  012700  000005                          MOV     #5,R0           ;SEND ENQ CHAR
013602  104021                                  ECHO
013604  004737  013634                          JSR     PC,10$          ;READ AND PRINT MESG
013610  104002  013722                          TYPEM,  20$             ;TYPE INSTRUCTIONS
013614  004737  013634                          JSR     PC,10$          ;READ AND PRINT MESG
013620  104002  013747                          TYPEM,  30$             ;TYPE INSTRUCTIONS
013624  004737  013634                          JSR     PC,10$          ;READ AND PRINT MESG
013630  104001                          2$:     CHAIN                   ;CHAIN TO NEXT TEST
013632  000756                                  BR      TEST32          ;LOOP ON TEST

013634  012702  013773                  10$:    MOV     #STORE,R2       ;SET TABLE ADR
013640  104013                                  READ                    ;READ FIRST CHAR
013642  023727  001124  000177          5$:     CMP     TEMPCH,#177     ;CHAR = RUBOUT?
013650  001002                                  BNE     3$              ;CONTINUE IF NOT RUBOUT
013652  000137  002450                          JMP     TTYIH           ;GO TO KYBD CONTROL
013656  113722  001124                  3$:     MOVB    TEMPCH,(R2)+    ;STORE CHAR
013662  012703  000062                          MOV     #50.,R3         ;SET DELAY COUNT
013666  013701  001102                  4$:     MOV     TIMER,R1
013672  104022                          8$:     INRDY                   ;ANY INPUT?
013674  000401                                  BR      6$              ;NO, WAIT FOR CHAR
013676  000761                                  BR      5$              ;YES, READ CHAR
013700  005301                          6$:     DEC     R1              ;DELAY WHILE WAITING FOR CHAR
013702  001373                                  BNE     8$
013704  005303                                  DEC     R3
013706  001367                                  BNE     4$
013710  105012                          7$:     CLRB    (R2)            ;SET NULL AS TERMINATOR IN TABLE
013712  104000  013772                          TYPE,   STORE-1         ;TYPE MESG ON TERMINAL RECEIVED ON
013716  104007                                  SCRLF                   ;SEND CR-LF
013720  000207                                  RTS     PC              ;RETURN TO TEST

013722  042504  051120  051505          20$:    .ASCIZ  <DEPRESS HERE IS KEY><CRLF>
013730  020123  042510  042522
013736  044440  020123  042513
013744  100131     000
013747     104  050105  042522          30$:    .ASCIZ  <DEPRESS CONTROL-E <CRLF>
013754  051523  041440  047117
013762  051124  046117  042455
013770  000200
013772     200                                  .ASCII  <CRLF

013773  000025                          STORE:  .BLKB   21.             ;20 CHAR + TERMINATOR BUFFER

                                                .EVEN
                                        ;XXXXXXXXXXXXXXXXX
                                        ;
                                        ;TEST33 -      FORM FEED OPTION
                                        ;
                                        ;XXXXXXXXXXXXXXXXX

 014020  000033                         TEST33: 33
 014022  014020                                 TEST33
 014024  104012                                 PRTHDR                    ;PRINT TEST HEADER
 014026  012705  014472                         MOV     #50$,R5           ;SET TABLE POINTER
 014032  012704  014456                         MOV     #60$,R4           ;SET TABLE POINTER
 014036  104002  014301                         TYPEM,  40$               ;PRINT INSTR
 014042  012701  000020                         MOV     #16.,R1           ;SET LF COUNT TO 16
 014046  104013                                 READ                      ;WAIT FOR KYBD FLAG
 014050  012700  000036                         MOV     #30.,R0           ;DELAY FOR HALF DUPLEX
 014054  104003                                 DELAY
 014056  022737  000177  001124                 CMP     #177,TEMPCH       ;CHECK FOR RUBOUT
 014064  001002                                 BNE     13$               ;EXIT IF RUBOUT
 014066  000137  002450                         JMP     TTYIH             ;GO TO KYBD CONTROL
 014072  104014                         13$:    CR                        ;SEND CR
 014074  104010                         8$:     LF                        ;SEND LF
 014076  005301                                 DEC     R1                ;DEC COUNT
 014100  001375                                 BNE     8$                ;CONTINUE
 014102  012700  000014                         MOV     #14,R0            ;SET FF
 014106  104011                                 PRINTC                    ;SEND IT
 014110  113701  014456                         MOVB    60$,R1            ;SET FILL COUNT
 014114  005000                         9$:     CLR     R0                ;SET NULL
 014116  104011                                 PRINTC                    ;SEND FILLS
 014120  005301                                 DEC     R1                ;DEC FILL COUNT
 014122  001374                                 BNE     9$                ;CONTINUE
 014124  104002  014417                         TYPEM,  45$               ;TYPE MESSAGE
 014130  010537  014210                 5$:     MOV     R5,2$             ;SET MESG
 014134  104013                                 READ                      ;WAIT FOR KYBD FLAG
 014136  012700  000036                         MOV     #30.,R0           ;DELAY FOR HALF DUPLEX
 014142  104003                                 DELAY
 014144  022737  000177  001124                 CMP     #177,TEMPCH       ;CHECK IF RUBOUT
 014152  001002                                 BNE     15$               ;EXIT IF RUBOUT
 014154  000137  002450                         JMP     TTYIH             ;GO TO KYBD CONTROL
 014160  104014                         15$:    CR                        ;SEND CR
 014162  012700  000014                         MOV     #14,R0            ;SEND FF
 014166  104011                                 PRINTC                    ;SEND IT
 014170  112401                                 MOVB    (R4)+,R1          ;GET FILL COUNT
 014172  005000                         11$:    CLR     R0                ;SET NULL
 014174  104011                                 PRINTC                    ;SEND FILLS
 014176  005301                                 DEC     R1                ;CONTINUE
 014200  001374                                 BNE     11$               ;FINISH NULLS
 014202  104002  014254                 12$:    TYPEM,  10$               ;PRINT MESG
 014206  104002                                 TYPEM
 014210  000000                         2$:     .WORD   0
 014212  104002  014262                         TYPEM,  20$
 014216  022525                                 CMP     (R5)+,(R5)+       ;INC TABLE POINTER
 014220  010537  014226                 3$:     MOV     R5,4$             ;SET MESG
 014224  104002                                 TYPEM                     ;PRINT MESG
 014226  000000                         4$:     .WORD   0
 2477   014230  104002  014271                  TYPEM,  30$
 2478   014234  104002  014254                  TYPEM,  10$
 2479   014240  005765  000004                  TST     4(R5)                   ;DONE TEST?
 2480   014244  001331                          BNE     5$                      ;NO, CONTINUE
 2481   014246  104006                          CRLF                            ;YES, SEND CR-LF
 2482   014250  104001                          CHAIN                           ;SELECT TEST OR LOOP
 2483   014252  000562                          BR      TEST33                  ;LOOP ON TEST
 2484
 2485   014254  026455  026455  000055  10$:    .ASCIZ  /-----/
 2486   014262  020042  043106  020057  20$:    .ASCIZ  ?" FF/ ?
 2487   014270     000
 2488   014271     042  047040  054105  30$:    .ASCIZ  /" NEXT /
 2489   014276  020124     000
 2490   014301     104  050105  042522  40$:    .ASCII  /DEPRESS FORMFEED RESET SWITCH/<CRLF>/AFTER EACH SWITCH SETTING/<CRLF>
 2491   014306  051523  043040  051117
 2492   014314  043115  042505  020104
 2493   014322  042522  042523  020124
 2494   014330  053523  052111  044103
 2495   014336  040600  052106  051105
 2496   014344  042440  041501  020110
 2497   014352  053523  052111  044103
 2498   014360  051440  052105  044524
 2499   014366  043516     200
 2500   014371     124  050131  020105          .ASCII  /TYPE SPACE WHEN READY/<CRLF>
 2501   014376  050123  041501  020105
 2502   014404  044127  047105  051040
 2503   014412  040505  054504     200
 2504   014417     055  026455  020055  45$:    .ASCIZ  /---- SET  3 INCH FORMFEED ----/
 2505   014424  042523  020124  031440
 2506   014432  044440  041516  020110
 2507   014440  047506  046522  042506
 2508   014446  042105  026440  026455
 2509   014454  000055
 2510   014456     002     005     010  60$:    .BYTE   2,5,8.,17.,20.,26.,32.,35.,50.,56.,68.
 2511   014461     021     024     032
 2512   014464     040     043     062
 2513   014467     070     104
 2514           014472                          .EVEN
 2515
 2516   014472  020040  000063          50$:    .ASCIZ  /  3/
 2517   014476  027063  000065                  .ASCIZ  /3.5/
 2518   014502  020040  000064                  .ASCIZ  /  4/
 2519   014506  027065  000065                  .ASCIZ  /5.5/
 2520   014512  020040  000066                  .ASCIZ  /  6/
 2521   014516  020040  000067                  .ASCIZ  /  7/
 2522   014522  020040  000070                  .ASCIZ  /  8/
 2523   014526  027070  000065                  .ASCIZ  /8.5/
 2524   014532  030440  000061                  .ASCIZ  / 11/
 2525   014536  030440  000062                  .ASCIZ  / 12/
 2526   014542  030440  000064                  .ASCIZ  / 14/
 2527   014546  020040  000040                  .ASCIZ  /   /
 2528   014552  000000                          .WORD   0                       ;END OF TABLE
```

```
                                        ;XXXXXXXXXXXXXXXX
                                        ;
                                        ;TEST34 -       HORIZONTAL TAB OPTION
                                        ;
                                        ;XXXXXXXXXXXXXXXX

014554  000034                          TEST34: 34
014556  014554                                  TEST34
014560  104012                                  PRTHDR                  ;PRINT TEST HEADER
014562  005004                                  CLR     R4              ;SET TABLE POINTER
014564  012737  014760  014756                  MOV     #16$,12$+2      ;RESET JUMP INSTR OR FIRST TIME THRU
014572  013703  001112                  2$:     MOV     WIDTH,R3        ;SET COLUMN COUNT
014576  012700  000033                          MOV     #33,R0          ;CLEAR OLD TABS
014602  104011                                  PRINTC
014604  012700  000062                          MOV     #62,R0
014610  104011                                  PRINTC
014612  104014                                  CR                      ;DO A CARRIAGE RETURN
014614  016401  015046                  3$:     MOV     20$(R4),R1      ;GET SPACE COUNT FOR TAB
014620  000405                                  BR      5$              ;SUBTRACT 1 FOR TAB SET
014622  012700  000040                  4$:     MOV     #40,R0          ;GET SPACE
014626  104011                                  PRINTC                  ;SEND IT
014630  005303                                  DEC     R3              ;DEC COLUMN COUNT
014632  001420                                  BEQ     6$              ;CR IF DONE LINE
014634  005301                          5$:     DEC     R1              ;DEC SPACE COUNT
014636  001371                                  BNE     4$              ;CONTINUE IF NOT DONE
014640  012700  000033                          MOV     #33,R0          ;SEND IT
014644  104011                                  PRINTC
014646  012700  000061                          MOV     #61,R0          ;SEND 1 - SET TAB
014652  104011                                  PRINTC
014654  012700  000010                          MOV     #10,R0          ;SET BACKSPACE
014660  104011                                  PRINTC
014662  012700  000117                          MOV     #'O,R0          ;PRINT O
014666  104011                                  PRINTC
014670  005303                                  DEC     R3              ;DEC COLUMN COUNT
014672  001350                                  BNE     3$              ;CONTINUE IF NOT DONE LINE
014674  104014                          6$:     CR                      ;SEND CR
014676  013703  001112                          MOV     WIDTH,R3        ;RESET COLUMN COUNT
014702  016401  015046                  17$:    MOV     20$(R4),R1      ;RESET COLUMN COUNT FOR TAB
014706  020127  000001                          CMP     R1,#1           ;ADD 1 IF FIRST LINE
014712  001001                                  BNE     11$
014714  005201                                  INC     R1
014716  016402  015072                  11$:    MOV     30$(R4),R2      ;SET FILL CHAR COUNT
014722  160103                                  SUB     R1,R3           ;SUBTRACT TAB FROM COLUMN COUNT
014724  002413                                  BLT     12$             ;BRANCH IF TOO MANY COLUMNS
014726  012700  000011                          MOV     #11,R0          ;SET TAB
014732  104011                                  PRINTC                  ;SEND IT
014734  005000                          14$:    CLR     R0              ;SET NULL CHAR - FILLS
014736  104011                                  PRINTC                  ;SEND FILL CHARS
014740  005302                                  DEC     R2              ;DEC FILL COUNT
014742  001374                                  BNE     14$             ;CONTINUE FILLS
014744  012700  000130                          MOV     #'X,R0          ;SET X CHAR
014750  104011                                  PRINTC                  ;SEND IT
014752  000761                                  BR      11$             ;CONTINUE
014754  000137  014760                  12$:    JMP     @#16$           ;SKIP FOLLOWING AFTER FIRST TIME THRU
```

```
014760  012737  015006  014756  16$:    MOV     #15$,12$+2
014766  104014                          CR                      ;SEND CR
014770  012700  000130                  MOV     #'X,R0          ;PRINT X
014774  104011                          PRINTC
014776  013703  001112                  MOV     WIDTH,R3        ;RESET COLUMNC COUNT
015002  005303                          DEC     R3              ;SUBTRACT ONE FOR FIRST X CHAR
015004  000736                          BR      17$             ;CONTINUE
015006  104006                  15$:    CRLF                    ;SEND CR-LF
015010  005724                          TST     (R4)+           ;INC TABLE POINTER
015012  016401  015046                  MOV     20$(R4),R1      ;GET COLUMN COUNT FOR TAB
015016  001403                          BEQ     13$             ;EXIT IF DONE TABLE (0)
015020  020137  001112                  CMP     R1,WIDTH        ;CHECK IF TOO LARGE
015024  101662                          BLOS    2$              ;CONTINUE TEST, OK
015026  012700  000033          13$:    MOV     #33,R0          ;CLEAR ALL TABS BEFORE EXITING
015032  104011                          PRINTC
015034  012700  000062                  MOV     #62,R0
015040  104011                          PRINTC
015042  104001                          CHAIN                   ;SELECT TEST OR LOOP ON TEST
015044  000643                          BR      TEST34          ;LOOP ON TEST

015046  000001  000002  000004  20$:    .WORD   1,2,4,8.,16.,32.,64.,128.,132.,0
015054  000010  000020  000040
015062  000100  000200  000204
015070  000000
015072  000001  000002  000003  30$:    .WORD   1,2,3,5,9.,18.,36.,71.,73.,0
015100  000005  000011  000022
015106  000044  000107  000111
015114  000000
```

```
                                        ;XXXXXXXXXXXXXXX
                                        ;
                                        ;TEST35 -      VERTICAL TAB OPTION
                                        ;
                                        ;XXXXXXXXXXXXXXX

015116  000035                          TEST35: 35
015120  015116                                  TEST35
015122  104012                                  PRTHDR                  ;PRINT TEST HEADER
015124  104002                          1$:     TYPEM                   ;TYPE INSTR
015126  015437                                  20$
015130  104013                                  READ                    ;WAIT FOR KYBD FLAG
015132  012700  000036                          MOV     #30.,R0         ;DELAY FOR HALF DUPLEX
015136  104003                                  DELAY
015140  022737  000177  001124                  CMP     #177,TEMPCH     ;CHECK CHAR
015146  001505                                  BEQ     12$             ;EXIT TEST IF RUBOUT
015150  005004                                  CLR     R4              ;SET LINE COUNT
015152  012700  000033                          MOV     #33,R0          ;CLEAR VERTICAL TABS
015156  104011                                  PRINTC
015160  012700  000064                          MOV     #64,R0
015164  104011                                  PRINTC
015166  104002                          2$:     TYPEM                   ;TYPE REF LINE
015170  015415                                  15$
015172  005204                                  INC     R4              ;INC LINE COUNT
015174  020427  000013                          CMP     R4,#13          ;CHECK IT
015200  003013                                  BGT     35$             ;BRANCH IF DONE REF.
015202  010401                                  MOV     R4,R1           ;GET LF COUNT
015204  104010                          3$:     LF                      ;SEND LF
015206  005301                                  DEC     R1              ;DEC LF COUNT
015210  001375                                  BNE     3$              ;CONTINUE
015212  012700  000033                          MOV     #33,R0          ;SET TAB FOR THIS LINE
015216  104011                                  PRINTC
015220  012700  000063                          MOV     #63,R0
015224  104011                                  PRINTC
015226  000757                                  BR      2$              ;CONTINUE
015230  012700  000014                  35$:    MOV     #14,R0          ;SEND FF
015234  104011                                  PRINTC
015236  104002                                  TYPEM                   ;TYPE MESG
015240  015531                                  30$
015242  104013                                  READ                    ;WAIT FOR KYBD FLAG
015244  012700  000036                          MOV     #30.,R0         ;DELAY FOR HALF DUPLEX
015250  104003                                  DELAY
015252  022737  000177  001124                  CMP     #177,TEMPCH     ;CHECK CHAR
015260  001440                                  BEQ     12$             ;EXIT TEST IF RUBOUT
015262  005004                                  CLR     R4              ;RESET LF COUNT
015264  104002                          4$:     TYPEM                   ;TYPE REF LINE
015266  015414                                  10$
015270  005204                                  INC     R4              ;INC LINE COUNT
015272  020427  000013                          CMP     R4,#13          ;CHECK IT
015276  003014                                  BGT     9$              ;BRANCH IF DONE
015300  012700  000013                          MOV     #13,R0          ;SEND TAB
015304  104011                                  PRINTC
015306  010401                                  MOV     R4,R1           ;SET FILL COUNT
015310  162701  000020                          SUB     #16.,R1         ;SUBTRACT 16
```

```
015314  003763                          BLE     4$                      ;SKIP NULLS IF COUNT < 0
015316  005000                  5$:     CLR     R0                      ;SET NULL CHAR
015320  104011                          PRINTC                          ;SEND NULLS
015322  005301                          DEC     R1                      ;DEC COUNT
015224  001374                          BNE     5$                      ;FINISH NULLS
015326  000756                          BR      4$                      ;CONTINUE
015330  012700  000033          8$:     MOV     #33,R0                  ;CLEAR VERTICAL TABS
015334  104011                          PRINTC
015336  012700  000064                  MOV     #64,R0
015342  104011                          PRINTC
015344  012700  000014                  MOV     #14,R0                  ;SEND FF
015350  104011                          PRINTC
015352  104006                          CRLF                            ;SEND CR-LF
015354  104010                          LF                              ;SEND BLANK LINE
015356  104001                          CHAIN                           ;SELECT TEST OR LOOP ON TEST
015360  000656                          BR      TEST35                  ;LOOP ON TEST
015362  012700  000033          12$:    MOV     #33,R0                  ;CLEAR ALL TABS BEFORE EXITING TEST
015366  104011                          PRINTC
015370  012700  000064                  MOV     #64,R0
015374  104011                          PRINTC
015376  012700  000014                  MOV     #14,R0                  ;SEND FF
015402  104011                          PRINTC
015404  104006                          CRLF
015406  104010                          LF
015410  000137  002450                  JMP     TTY1H                   ;GO KYBD CONTROL

015414     040                  10$:    .ASCII  <40>
015415     055  026455  026455  15$:    .ASCIZ  /--------<<<<<<<</<15>
015422  026455  036055  036074
015430  036074  036074  006474
015436     000
015437     123  052105  030440  20$:    .ASCII  /SET 14 INCH FORM FEED/<ACRLF>
015444  020064  047111  044103
015452  043040  051117  020115
015460  042506  042105     200
015465     104  050105  042522          .ASCIZ  /DEPRESS TOP OF FORM RESET SWITCH/<ACRLF><12><12>
015472  051523  052040  050117
015500  047440  020106  047506
015506  046522  051040  051505
015514  052105  051440  044527
015522  041524  100110  005012
015530     000
015531     001  000401  042522  30$:    .ASCIZ  <1><1><1>/REMOVE /<57>/ RESET REF/
015536  047515  042526  027440
015544  051040  051505  052105
015552  051040  043105     000
        015560                          .EVEN
```

```
                                        .SBTTL  DH11 VARIABLE PARAMETER TABLE



                                ;**********
                                ;
                                ;DH11 PROGRAMMABLE PRAMETER TABLE
                                ;
                                ;THIS TABLE IS PROVIDED TO ALLOW THE DEGREE OF FREEDOM AVAILABLE
                                ;IN THE DH11 PROGRAMMABLE MULTIPLEXER. THERE ARE 256 ENTRIES, ONE
                                ;FOR EACH OF THE POSSIBLE 16 LINES ON EACH OF THE POSSIBLE 16
                                ;DH11'S.  EACH OF THE 256 LINES ARE INITIALIZED AS FOLLOWS:(=16707)
                                ;       CHARACTER LENGTH        = 8 BITS
                                ;       NO. OF STOP BITS        = 2
                                ;       PARITY GEN. AND DET.    NONE
                                ;       OPERATING MODE          FULL DUPLEX
                                ;       TRANSMITTER SPEED       = 300 BAUD
                                ;       RECEIVER SPEED  = 300 BAUD
                                ;
                                ;IF ANY LINE SHOULD DIFFER, THE APPROPRIATE ENTRY FOR THE LINE
                                ;SHOULD BE CHANGED BEFORE RUNNING THE DIAGNOSTIC.  REFER TO THE LINE
                                ;PARAMETER REGISTER IN THE DH11 PROGRAMMING MANUAL FOR INSTRUCTIONS.
                                ;
                                ;**********

015560                          DH1100:
015560  016707                          .WORD   16707
015562  016707                          .WORD   16707
015564  016707                          .WORD   16707
015566  016707                          .WORD   16707
015570  016707                          .WORD   16707
015572  016707                          .WORD   16707
015574  016707                          .WORD   16707
015576  016707                          .WORD   16707
015600  016707                          .WORD   16707
015602  016707                          .WORD   16707
015604  016707                          .WORD   16707
015606  016707                          .WORD   16707
015610  016707                          .WORD   16707
015612  016707                          .WORD   16707
015614  016707                          .WORD   16707
015616  016707                          .WORD   16707
015620                          DH1101:
015620  016707                          .WORD   16707
015622  016707                          .WORD   16707
015624  016707                          .WORD   16707
015626  016707                          .WORD   16707
015630  016707                          .WORD   16707
015632  016707                          .WORD   16707
015634  016707                          .WORD   16707
015636  016707                          .WORD   16707
015640  016707                          .WORD   16707
015642  016707                          .WORD   16707
015644  016707                          .WORD   16707
```

```
 2766  015646  016707                        .WORD    16707
 2767  015650  016707                        .WORD    16707
 2768  015652  016707                        .WORD    16707
 2769  015654  016707                        .WORD    16707
 2770  015656  016707                        .WORD    16707
 2771  015660                       DH1102:
 2772  015660  016707                        .WORD    16707
 2773  015662  016707                        .WORD    16707
 2774  015664  016707                        .WORD    16707
 2775  015666  016707                        .WORD    16707
 2776  015670  016707                        .WORD    16707
 2777  015672  016707                        .WORD    16707
 2778  015674  016707                        .WORD    16707
 2779  015676  016707                        .WORD    16707
 2780  015700  016707                        .WORD    16707
 2781  015702  016707                        .WORD    16707
 2782  015704  016707                        .WORD    16707
 2783  015706  016707                        .WORD    16707
 2784  015710  016707                        .WORD    16707
 2785  015712  016707                        .WORD    16707
 2786  015714  016707                        .WORD    16707
 2787  015716  016707                        .WORD    16707
 2788  015720                       DH1103:
 2789  015720  016707                        .WORD    16707
 2790  015722  016707                        .WORD    16707
 2791  015724  016707                        .WORD    16707
 2792  015726  016707                        .WORD    16707
 2793  015730  016707                        .WORD    16707
 2794  015732  016707                        .WORD    16707
 2795  015734  016707                        .WORD    16707
 2796  015736  016707                        .WORD    16707
 2797  015740  016707                        .WORD    16707
 2798  015742  016707                        .WORD    16707
 2799  015744  016707                        .WORD    16707
 2800  015746  016707                        .WORD    16707
 2801  015750  016707                        .WORD    16707
 2802  015752  016707                        .WORD    16707
 2803  015754  016707                        .WORD    16707
 2804  015756  016707                        .WORD    16707
 2805  015760                       DH1104:
 2806  015760  016707                        .WORD    16707
 2807  015762  016707                        .WORD    16707
 2808  015764  016707                        .WORD    16707
 2809  015766  016707                        .WORD    16707
 2810  015770  016707                        .WORD    16707
 2811  015772  016707                        .WORD    16707
 2812  015774  016707                        .WORD    16707
 2813  015776  016707                        .WORD    16707
 2814  016000  016707                        .WORD    16707
 2815  016002  016707                        .WORD    16707
 2816  016004  016707                        .WORD    16707
 2817  016006  016707                        .WORD    16707
 2818  016010  016707                        .WORD    16707
 2819  016012  016707                        .WORD    16707
 2820  016014  016707                         .WORD    16707
 2821  016016  016707                         .WORD    16707
 2822  016020                       DH1105:
 2823  016020  016707                         .WORD    16707
 2824  016022  016707                         .WORD    16707
 2825  016024  016707                         .WORD    16707
 2826  016026  016707                         .WORD    16707
 2827  016030  016707                         .WORD    16707
 2828  016032  016707                         .WORD    16707
 2829  016034  016707                         .WORD    16707
 2830  016036  016707                         .WORD    16707
 2831  016040  016707                         .WORD    16707
 2832  016042  016707                         .WORD    16707
 2833  016044  016707                         .WORD    16707
 2834  016046  016707                         .WORD    16707
 2835  016050  016707                         .WORD    16707
 2836  016052  016707                         .WORD    16707
 2837  016054  016707                         .WORD    16707
 2838  016056  016707                         .WORD    16707
 2839  016060                       DH1106:
 2840  016060  016707                         .WORD    16707
 2841  016062  016707                         .WORD    16707
 2842  016064  016707                         .WORD    16707
 2843  016066  016707                         .WORD    16707
 2844  016070  016707                         .WORD    16707
 2845  016072  016707                         .WORD    16707
 2846  016074  016707                         .WORD    16707
 2847  016076  016707                         .WORD    16707
 2848  016100  016707                         .WORD    16707
 2849  016102  016707                         .WORD    16707
 2850  016104  016707                         .WORD    16707
 2851  016106  016707                         .WORD    16707
 2852  016110  016707                         .WORD    16707
 2853  016112  016707                         .WORD    16707
 2854  016114  016707                         .WORD    16707
 2855  016116  016707                         .WORD    16707
 2856  016120                       DH1107:
 2857  016120  016707                         .WORD    16707
 2858  016122  016707                         .WORD    16707
 2859  016124  016707                         .WORD    16707
 2860  016126  016707                         .WORD    16707
 2861  016130  016707                         .WORD    16707
 2862  016132  016707                         .WORD    16707
 2863  016134  016707                         .WORD    15707
 2864  016136  016707                         .WORD    16707
 2865  016140  016707                         .WORD    16707
 2866  016142  016707                         .WORD    16707
 2867  016144  016707                         .WORD    16707
 2868  016146  016707                         .WORD    16707
 2869  016150  016707                         .WORD    16707
 2870  016152  016707                         .WORD    16707
 2871  016154  016707                         .WORD    16707
 2872  016156  016707                         .WORD    16707
 2873  016160                       DH1110:
```

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2726  016020  016707                          .WORD   16707
2727  016022  016707                          .WORD   16707
2728  016024  016707                          .WORD   16707
2729  016026  016707                          .WORD   16707
2730  016030  016707                          .WORD   16707
2731  016032  016707                          .WORD   16707
2732  016034  016707                          .WORD   16707
2733  016036  016707                          .WORD   16707
2734  016040  016707                          .WORD   16707
2735  016042  016707                          .WORD   16707
2736  016044  016707                          .WORD   16707
2737  016046  016707                          .WORD   16707
2738  016050  016707                          .WORD   16707
2739  016052  016707                          .WORD   16707
2740  016054  016707                          .WORD   16707
2741  016056  016707                          .WORD   16707
2742  016060  016707                          .WORD   16707
2743  016062  016707                          .WORD   16707
2744  016064  016707                          .WORD   16707
2745  016066  016707                          .WORD   16707
2746  016070  016707                          .WORD   16707
2747  016072  016707                          .WORD   16707
2748  016074  016707                          .WORD   16707
2749  016076  016707                          .WORD   16707
2750  016100  016707                          .WORD   16707
2751  016102  016707                          .WORD   16707
2752  016104  016707                          .WORD   16707
2753  016106  016707                          .WORD   16707
2754  016110  016707                          .WORD   16707
2755  016112  016707                          .WORD   16707
2756  016114  016707                          .WORD   16707
2757  016116  016707                          .WORD   16707
2758  016120                          DH1111:
2759  016120  016707                          .WORD   16707
2760  016122  016707                          .WORD   16707
2761  016124  016707                          .WORD   16707
2762  016126  016707                          .WORD   16707
2763  016130  016707                          .WORD   16707
2764  016132  016707                          .WORD   16707
2765  016134  016707                          .WORD   16707
2766  016136  016707                          .WORD   16707
2767  016140  016707                          .WORD   16707
2768  016142  016707                          .WORD   16707
2769  016144  016707                          .WORD   16707
2770  016146  016707                          .WORD   16707
2771  016150  016707                          .WORD   16707
2772  016152  016707                          .WORD   16707
2773  016154  016707                          .WORD   16707
2774  016156  016707                          .WORD   16707
2775  016160  016707                          .WORD   16707
2776  016162  016707                          .WORD   16707
2777  016164  016707                          .WORD   16707
2778  016166  016707                          .WORD   16707
2779  016170  016707                          .WORD   16707
2780  016172  016707                          .WORD   16707
2781  016174  016707                          .WORD   16707
2782  016176  016707                          .WORD   16707
2783  016200  016707                          .WORD   16707
2784  016202  016707                          .WORD   16707
2785  016204  016707                          .WORD   16707
2786  016206  016707                          .WORD   16707
2787  016210  016707                          .WORD   16707
2788  016212  016707                          .WORD   16707
2789  016214  016707                          .WORD   16707
2790  016216  016707                          .WORD   16707
2791  016220                          DH1112:
2792  016220  016707                          .WORD   16707
2793  016222  016707                          .WORD   16707
2794  016224  016707                          .WORD   16707
2795  016226  016707                          .WORD   16707
2796  016230  016707                          .WORD   16707
2797  016232  016707                          .WORD   16707
2798  016234  016707                          .WORD   16707
2799  016236  016707                          .WORD   16707
2800  016240  016707                          .WORD   16707
2801  016242  016707                          .WORD   16707
2802  016244  016707                          .WORD   16707
2803  016246  016707                          .WORD   16707
2804  016250  016707                          .WORD   16707
2805  016252  016707                          .WORD   16707
2806  016254  016707                          .WORD   16707
2807  016256  016707                          .WORD   16707
2808  016260  016707                          .WORD   16707
2809  016262  016707                          .WORD   16707
2810  016264  016707                          .WORD   16707
2811  016266  016707                          .WORD   16707
2812  016270  016707                          .WORD   16707
2813  016272  016707                          .WORD   16707
2814  016274  016707                          .WORD   16707
2815  016276  016707                          .WORD   16707
2816  016300  016707                          .WORD   16707
2817  016302  016707                          .WORD   16707
2818  016304  016707                          .WORD   16707
2819  016306  016707                          .WORD   16707
2820  016310  016707                          .WORD   16707
2821  016312  016707                          .WORD   16707
2822  016314  016707                          .WORD   16707
2823  016316  016707                          .WORD   16707
2824  016320                          DH1113:
2825  016320  016707                          .WORD   16707
2826  016322  016707                          .WORD   16707
2827  016324  016707                          .WORD   16707
```

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  2928  016326  016707                                      .WORD   16707
  2929  016330  016707                                      .WORD   16707
  2930  016332  016707                                      .WORD   16707
  2931  016334  016707                                      .WORD   16707
  2932  016336  016707                                      .WORD   16707
  2933  016340  016707                                      .WORD   16707
  2934  016342  016707                                      .WORD   16707
  2935  016344  016707                                      .WORD   16707
  2936  016346  016707                                      .WORD   16707
  2937  016350  016707                                      .WORD   16707
  2938  016352  016707                                      .WORD   16707
  2939  016354  016707                                      .WORD   16707
  2940  016356  016707                                      .WORD   16707
  2941  016360                                   DH1114:
  2942  016360  016707                                      .WORD   16707
  2943  016362  016707                                      .WORD   16707
  2944  016364  016707                                      .WORD   16707
  2945  016366  016707                                      .WORD   16707
  2946  016370  016707                                      .WORD   16707
  2947  016372  016707                                      .WORD   16707
  2948  016374  016707                                      .WORD   16707
  2949  016376  016707                                      .WORD   16707
  2950  016400  016707                                      .WORD   16707
  2951  016402  016707                                      .WORD   16707
  2952  016404  016707                                      .WORD   16707
  2953  016406  016707                                      .WORD   16707
  2954  016410  016707                                      .WORD   16707
  2955  016412  016707                                      .WORD   16707
  2956  016414  016707                                      .WORD   16707
  2957  016416  016707                                      .WORD   16707
  2958  016420                                   DH1115:
  2959  016420  016707                                      .WORD   16707
  2960  016422  016707                                      .WORD   16707
  2961  016424  016707                                      .WORD   16707
  2962  016426  016707                                      .WORD   16707
  2963  016430  016707                                      .WORD   16707
  2964  016432  016707                                      .WORD   16707
  2965  016434  016707                                      .WORD   16707
  2966  016436  016707                                      .WORD   16707
  2967  016440  016707                                      .WORD   16707
  2968  016442  016707                                      .WORD   16707
  2969  016444  016707                                      .WORD   16707
  2970  016446  016707                                      .WORD   16707
  2971  016450  016707                                      .WORD   16707
  2972  016452  016707                                      .WORD   16707
  2973  016454  016707                                      .WORD   16707
  2974  016456  016707                                      .WORD   16707
  2975  016460                                   DH1116:
  2976  016460  016707                                      .WORD   16707
  2977  016462  016707                                      .WORD   16707
  2978  016464  016707                                      .WORD   16707
  2979  016466  016707                                      .WORD   16707
  2980  016470  016707                                      .WORD   16707
  2981  016472  016707                                      .WORD   16707
```

D08

```
[illegible]  015474  016707                    .WORD   16707
[illegible]  015476  016707                    .WORD   16707
[illegible]  015500  016707                    .WORD   16707
[illegible]  015502  016707                    .WORD   16707
[illegible]  015504  016707                    .WORD   16707
[illegible]  015506  016707                    .WORD   16707
[illegible]  015510  016707                    .WORD   16707
[illegible]  015512  016707                    .WORD   16707
[illegible]  015514  016707                    .WORD   16707
[illegible]  015516  016707                    .WORD   16707
[illegible]  015520                    DH11T:
[illegible]  015520  016707                    .WORD   16707
[illegible]  015522  016707                    .WORD   16707
[illegible]  015524  016707                    .WORD   16707
[illegible]  015526  016707                    .WORD   16707
[illegible]  015530  016707                    .WORD   16707
[illegible]  015532  016707                    .WORD   16707
[illegible]  015534  016707                    .WORD   16707
[illegible]  015536  016707                    .WORD   16707
[illegible]  015540  016707                    .WORD   16707
[illegible]  015542  016707                    .WORD   16707
[illegible]  015544  016707                    .WORD   16707
[illegible]  015546  016707                    .WORD   16707
[illegible]  [illegible]  016707               .WORD   16707
[illegible]  [illegible]  016707               .WORD   16707
[illegible]  [illegible]  016707               .WORD   16707
[illegible]  [illegible]  016707               .WORD   16707
[illegible]  [illegible]  016707               .WORD   16707
[illegible]  [illegible]  016707               .WORD   16707
[illegible]  [illegible]  016707               .WORD   16707
[illegible]  [illegible]  016707               .WORD   16707
[illegible]  [illegible]  [illegible]          .WORD   16707
```

```
                                        .SBTTL  EXISTING LINE TABLE


                                ;**********
                                ;
                                ;EXISTING LINE TABLE
                                ;
                                ;THIS 16 WORD TABLE, ONE ENTRY FOR EACH OF THE POSSIBLE 16 DJ11'S
                                ;OF DJ11'S INDICATES WHICH OF THE LINES HAVE A TERMINAL CONNECTED
                                ;THIS TABLE SHOULD BE INITIALIZED BEFORE RUNNING THE DIAGNOSTIC.  BIT 0
                                ;IS LINE #0 WHILE BIT 15 IS LINE #15.  A 1 INDICATES THAT A TERMINAL IS
                                ;NOT CONNECTED WHILE A 0 INDICATES THAT THE TERMINAL DOES EXIST ON THE
                                ;LINE.
                                ;
                                ;EX.  IF THERE ARE TERMINALS ON LINE #0,#5,#10 AND#13  ONLY, ON THE
                                ;FIRST DJ11 AND NO OTHER DJ11 EXIST, SET THE FIRST ENTRY IN THIS
                                ;TABLE = 155736 AND ALL OTHER WORDS = 177777.  THE DIAGNOSTIC IS
                                ;INITIALIZED SO THAT NO TERMINALS EXIST.
                                ;
                                ;**********

      016660    177777          ELTAB:  .WORD   177777                  ;FIRST DJ11
      016662    177777                  .WORD   177777
      016664    177777                  .WORD   177777
      016666    177777                  .WORD   177777
      016670    177777                  .WORD   177777
      016672    177777                  .WORD   177777
      016674    177777                  .WORD   177777
      016676    177777                  .WORD   177777
      016700    177777                  .WORD   177777
      016702    177777                  .WORD   177777
      016704    177777                  .WORD   177777
      016706    177777                  .WORD   177777
      016710    177777                  .WORD   177777
      016712    177777                  .WORD   177777
      016714    177777                  .WORD   177777
      016716    177777                  .WORD   177777
```

```
                                                        .SBTTL  DIAGNOSTIC MESSAGES

016620  007600  040515  047111  STARTM: .ASCII  <CRLF><17>/MAINDEC-11-DZLAC-C/<CRLF>
016626  042504  026503  030461
016634  042055  046132  041501
016642  041455     200
016645     114  031501  020066          .ASCII  /LA36 TERMINAL DIAGNOSTIC/<CRLF>
016652  042524  046522  047111
016660  046101  042040  040511
016666  047107  051517  044524
016674  100103
016676  044104  030461  023040          .ASCIZ  /DH11 & DJ11 INTERFACES/<CRLF><12>
016704  042040  030512  020061
016712  047111  042524  043122
016720  041501  051505  005200
016726     000
016727     200  042412  042116  ENDPAS: .ASCII  <CRLF><12>/END OF PASS  /
016734  047440  020106  040520
016742  051523  020040
016746  030060  030060  005200  PASMES: .ASCIZ  /0000/<CRLF><12>
016754     000
016755     060  020060  044104  DH11S:  .ASCIZ  /00 DH11'S UNDER TEST/<CRLF><12>
016762  030461  051447  052440
016770  042116  051105  052040
016776  051505  100124  000012
017004  030060  042040  030512  DJ11S:  .ASCIZ  /00 DJ11'S UNDER TEST/<CRLF><12>
017012  023461  020123  047125
017020  042504  020122  042524
017026  052123  005200     000
017033     200  005017  042524  HDRMSG: .ASCIZ  <CRLF><17><12>/TEST #/
017040  052123  021440     000
017045     060  030060  041440  HDRD:   .ASCIZ  /000 COLUMNS/<CRLF><12>
017052  046117  046525  051516
017060  005200     000
017063     124  050131  020105  E02SMA: .ASCII  /TYPE ANY PRINTABLE CHARACTER /
017070  047101  020131  051120
017076  047111  040524  046102
017104  020105  044103  051101
017112  041501  042524  020122
017120  047101  020104  044514          .ASCIZ  /AND LISTEN FOR BELL.............../
017126  052123  047105  043040
017134  051117  041040  046105
017142  027114  027056  027056
017150  027056  027056  027056
017156  027056  027056     000
017163     200  047516  020124  E02SMB: .ASCIZ  <CRLF>/NOT ENOUGH COLUMNS/<CRLF>
017170  047105  052517  044107
017176  041440  046117  046525
017204  051516  000200
017210  042600  044103  020117  E02END: .ASCIZ  <CRLF>/ECHO TEST TERMINATED/<CRLF>
017216  042524  052123  052040
017224  051105  044515  040516
```

G08

```
 [illegible] 017232  042524  100124     000
 [illegible] [illegible]     040     040         ERRGN:  .ASCII
 [illegible] 017241     040  020040     040      LINES:  .ASCII                         ;MESG FOR TEST E023
 [illegible]
 [illegible] 017245     040  020040  020040      LINEEA: .ASCIZ               <CRLF>
 [illegible] [illegible] 020040 [illegible]  000
 [illegible] [illegible] [illegible] [illegible] 042523  MESG3:  .ASCIZ  <CRLF> 17 12 SELECT TEST #
 [illegible]
 [illegible]
 [illegible] 017300  000040

 [illegible] 017302  052105  047105              EVEN:   .ASCII  EVEN
 [illegible] [illegible] [illegible] [illegible]
 [illegible] 017306 [illegible] [illegible]
 [illegible]                                             .EVEN
 [illegible]

 [illegible]         000001                              .END
 MAINDEC-11-DZLAD-C     MACY11 27(657)  12-SEP-75  13:30  PAGE 72                                        SEQ 0099
DZLADC.P11        SYMBOL TABLE

ACRLF = 000200          ACTIV   001222          AUTENF  004274          BAR     001150
BITTAB  001162          BIT0  = 000001          BIT1  = 000002          BIT10 = 002000
BIT11 = 004000          BIT12 = 010000          BIT13 = 020000          BIT14 = 040000
BIT15 = 100000          BIT2  = 000004          BIT3  = 000010          BIT4  = 000020
BIT5  = 000040          BIT6  = 000100          BIT7  = 000200          BIT8  = 000400
BIT9  = 001000          BTOASC= 104015          BUFR    012064          BYCR    001146
CARA    001144          CHAIN = 104001          CHAINN  001746          CHAINY  001772
CHARAC  006010          CLEAN = 104017          CNTDH   001154          CNTLSW  001104
CNVCTR  004266          CR    = 104014          CRLF  = 104006          CSR     001236
CURTST  001120          DELAY = 104003          DHADR   001134          DHCNT   001230
DH11S   016755          DH1100  015560          DH1101  015620          DH1102  015660
DH1103  015720          DH1104  015760          DH1105  016020          DH1106  016060
DH1107  016120          DH1110  016160          DH1111  016220          DH1112  016260
DH1113  016320          DH1114  016360          DH1115  016420          DH1116  016460
DH1117  016520          DIGIT   004270          DISPRE  000174          DJCNT   001226
DJ11S   017004          DLY     004056          ECHO  = 104021          ECHODJ  003462
ECOEND  017210          ELTAB   016560          EMTINT  003256          EMTTAB  003332
ENDIT   005262          ENDITD  005254          ENDITR  005246          ENDPAS  016727
END3    001400          END4    001446          E020    010756          E021    011022
E021A   011030          E021B   011064          E022    011074          E022A   011102
E022B   011144          E023    011360          E023M   017237          E024    011702
E024B   011710          E024R   011770          E025    012466          E025MA  017063
E025MB  017163          EVEN    017302          FORWD = 104016          HDRMSG  017033
HDRO    017045          HERE    010600          INRDY = 104022          IOSW    001224
LF    = 104010          LFCNT   001132          LINENO  001156          LINE2   006774
LINE3   007516          LINES   017241          LINESA  017245          LOGICA  010570
LPAR    001142          MACHER  000004          MASK    001160          MESG3   017257
MG24    011672          MG25    011676          MONIC   011154          MOVNUM  011620
NL      002544          NRCRA   001140          NXTST   001110          ODD     017306
OPEN  = 000000          OUTPUT  012002          PARITY  001126          PASCNT  010754
PASMES  016746          PC    =%000007          PCHAR   001130          PFAIL   004100
POPSPR= 002626          POSI    001122          PRGTAB  003156          PRINTC= 104011
PRINTJ  005324          PRTHDR= 104012          PT0     006410          PT1     006464
PT10    010334          PT11    010472          PT12    010524          PT12A   010532
PT17A   010514          PT17B   010604          PT17D   010626          PT2     006606
PT3     007236          PT4     007356          PT5     007534          PT5AL   007702
PT6     007740          PT7     010122          READ  = 104013          REF     007466
REPT    001114          RESTRT  004136          RTNNO   001106          R0    =%000000
R1    =%000001          R2    =%000002          R3    =%000003          R4    =%000004
R5    =%000005          SAVR6   004134          SCANDH  002604          SCANDJ  003016
SCR     001136          SCRLF = 104007          SCR1    001232          SCR2    001234
SETDJ   003124          SETERM  002660          SP    =%000006          SPBOT   001100
SPC     006576          SPCNT   001116          SPSP    006556          SP2     006570
SR      001244          SSR     001152          START   001256          STARTM  016620
STARTX  001262          START1  001246          STORE   013773          STRLN   011542
SWREG   000176          TBUF    001242          TCR     001240          TEMPCH  001124
TEMPWR  004272          TERM    012054          TESTC = 104020          TEST30  012570
TEST31  012752          TEST32  013570          TEST33  014020          TEST34  014554
TEST35  015116          TIMER   001102          TTYCTL= 104004          TTYJ    002022
TTYJA   002024          TTYJTL= 104005          TTY1    002052          TTY1A   002054
TTY1B   002104          TTY1G   002410          TTY1H   002450          TTY1L   002516
TYP     003776          TYPE  = 104000          TYPEM = 104002          TYPM    004036
[illegible] 012750      WIDTH   001112          $BTASC  004202          $CLEAN  001732
$CP     004370          $CRLF   004356          $ECHO   003400          $FORWD  002562
```

I08

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MAINDEC-11-DZLAC-C    MACY11 27(657)  12-SEP-75  13:30  PAGE 73                                                    SEQ 0099
DZLACC.P11      SYMBOL TABLE

$INRDY  003536          $LF     004360          $ARHOR  004400          $PRTC   004454
$READ   003600          $SCRLF  004340          $TESTC  004306          .     = 017312


 ERRORS DETECTED:  0

 *.DZLACC-DZLACC.SOL
 RUN-TIME: 9 12 0 SECONDS
 CORE USED:  6K
```

JOB

```
Spooler runtime 11 Seconds, 348 KCS, 332 disk reads, 3 disk writes, 99 pages
[illegible] Date 14-Oct-76 15:[illegible]:47 Monitor IPC-0 [illegible] [illegible] [illegible]
000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000111111111111111111111111111111111
000000000111111111122222222223333333333444444444455555555556666666666777777777788888888889999999999000000000011111111112222222222333
[illegible]5567890123456789012 #
000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000111111111111111111111111111111111
000000000111111111122222222223333333333444444444455555555556666666666777777777788888888889999999999000000000011111111112222222222333
```