IDENTIFICATION

PRODUCT CODE:	MAINDEC-11-DZLAD-C-D
PRODUCT NAME:	LA36 TERMINAL (DH11 & DJ11 INTERFACE)
DATE CREATED:	OCTOBER 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 B 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 TEST, 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*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:

```
0X0X0X0X0X0X0X0X0X0X0X0X0X0X0X0X0X
```

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:

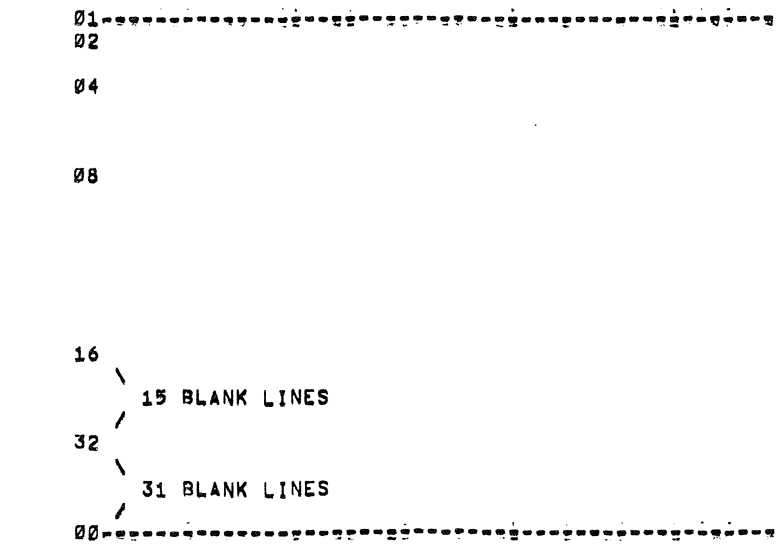
```
0 0 0 0 0 0 0 0 0
 X
   X
     X
       X
         X
           X
             X
               X
                 X
```

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:



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:

```
ØØØØØØØØØØØØØØØØØØØØØØØØØØØØ22




12345678901234567890123456789Ø
12345678901234567890123456789Ø
```

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:

```
0000000000000000000000000000022
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
12345678901234567890123456789Ø
12345678901234567890123456789Ø
```

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-@
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
 @ @ @ @ @ @ @ @ @ @ @ @ @ @
& & & & & & & & & & & & & & &
```

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

 @ @ @ @ @ @ @ @ @ @
 @ @ @ @ @ @ @ @ @ @
 @ @ @ @ @ @ @ @ @ @

& & & & & & & & & &
& & & & & & & & & &
& & & & & & & & & &
```

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
```

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:

```
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
BBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
BBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
```

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:

```
AAAAAAAAAAAAAAA

AAAAAAAAAAAAAAA
AAAAAAAAAAAAAAA
AAAAAAAAAAAAAAA
AAAAAAAAAAAAAAA
AAAAAAAAAAAAAAA

BBBBBBBBBBBBBBB

BBBBBBBBBBBBBBB
BBBBBBBBBBBBBBB
BBBBBBBBBBBBBBB
BBBBBBBBBBBBBBB
BBBBBBBBBBBBBBB
```

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 1.8 SECONDS IS INSERTED BETWEEN EACH CHARACTER TO ALLOW THE PRINT HEAD TO PERFORM AN LCV 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) OF 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= !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
#2= !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~

#1= !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
#2= !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
```

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

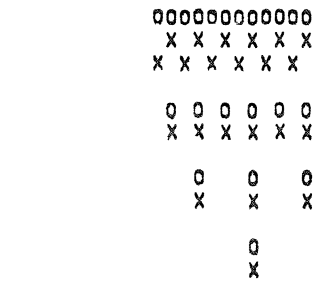
THIS TEST CHECKS THE ABILITY TO SET A TAB IN EVERY COLUMN AND AT PREDETERMINED INTERVALS, AS WELL AS THE ABILITY TO CLEAR ALL TABS. THE PROGRAM SETS A TAB IN THE PREDETERMINED COLUMN, DOES A BACKSPACE, AND PRINTS AN "O". AFTER THE LINE IS PRINTED AND THE TABS ARE SET, A CARRIAGE RETURN IS SENT AND THEN THE PRINT HEAD IS POSITIONED USING TABS AND X'S ARE PRINTED OVER THE O'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 O'S AND THE X'S WIL BE PRINTED ON THE NEXT LINE UNDER THE O'S. THE FIRST LINE OF O'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.

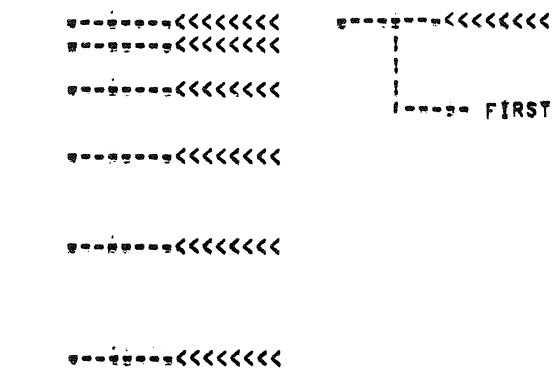
EXAMPLE:



6.3.6 TEST 35 - VERTICAL TAB OPTION

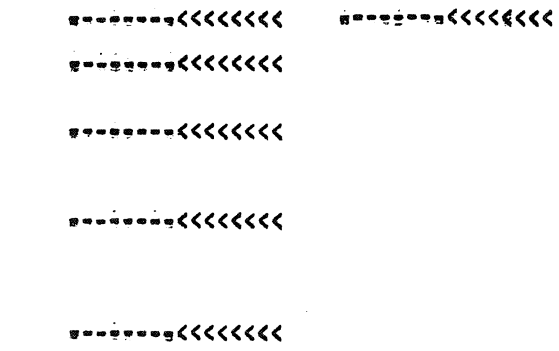
THIS TEST CHECKS THE VERTICAL TAB OPTION BY TESTING THE ABILITY TO SET TABS IN VARIOUS POSITIONS OF A 14 INCH FORM. AN INSTRUCTION IS PRINTED TELLING THE OPERATOR TO SET A 14 INCH FORM LENGTH AND DEPRESS THE TOP OF FORM RESET SWITCH. WHEN READY, TYPE ANY CHARACTER (EXCEPT RUBOUT) ON THE KEYBOARD TO CONTINUE. 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:



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:



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



                ;LA36 TERMINAL DIAGNOSTIC
                ;DH11 AND DJ11 INTERFACES


                ;AUTHOR:  ROBERT W. BAKER

                ;COPYRIGHT 1974,1975, DIGITAL EQUIPMENT CORP., MAYNARD, MASS, 01754




                        .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
```



```
                                ;       PROGRAM TRAP EQUATES
104000                                  TYPE=EMT+0
104001                                  CHAIN=EMT+1
104002                                  TYPEM=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                                  PRTHOR=EMT+12
104013                                  READ=EMT+13
104014                                  OR=EMT+14
104015                                  BTOASC=EMT+15
104016                                  FORWD=EMT+16
104017                                  CLEAN=EMT+17
104020                                  TESTC=EMT+20
104021                                  ECHO=EMT+21
104022                                  INRDY=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                          MACHERR:

                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    DH11 TESTS
000204  000137  001246                 JMP     START1          ;RUN    DJ11 TESTS


                001100                  .=1100

001100  000000          SPSOT:  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          CAR:    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          ACTIVI: 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
001232  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                   START1: BR      START1          ;SET UP FOR DH11 TESTS
001256  005037  001224           START:  CLR     IOSW
001262  012706  001100           START1: MOV     #SPSOT,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  104017                           CLEAN                   ;CLEAN UP
001334  005037  001104                   CLR     CNFLSW          ;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     2$              ;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 8-7, SAVE AND
                                        ;CONVERT TO 3 ASCII CHARACTERS, A WIDTH GT132
                                        ;OR LT30 COLUMNS (DECIMAL) WILL BE ABORTED TO 132.
                                        ;
                                        ;**********

001450  012701  177570          MOV     @SR,R1          ;PUT (SR) INTO R1
001454  042701  177400          BIC     #177400,R1      ;SAVE ONLY BITS 8-7
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     #HDR8,R0        ;ADDR TO STORE ASC11 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       ;CHECK IF WANT TEST SELECTION?
001700  001004                  BNE     12$             ;BRANCH IF BIT 8 IS SET (YES)
001702  012737  000410  001110      MOV     #PT8,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      TT9JA           ;WAIT FOR TERMINAL CONTROL FROM DJ11


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

001732  012737  000006  000004  SCLEAN: 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       ;CHECK IF TERMINAL CONTROL
001754  001405                          BEQ     2$              ;BRANCH IF NOT
001756  005737  001224                  TST     @DSW            ;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 DJ11'S 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$:     TST     ACTIV           ;TEST IF ENTRY IS FROM A TEST
002072  001146                          BNE     TTY1G           ;BRANCH IF IT IS
002074  004737  002604                  JSR     PC,SCANDH       ;LOOK FOR INPUT
002100  004737  002660                  JSR     PC,SETERM       ;SET TERMINAL DATA
002104  042730  177600  TTY1B:  BIC     #177600,R0      ;SAVE ONLY CHAR
002110  010037  001124                  MOV     R0,TEMPCH       ;GET CHAR
002114  020027  000040          1$:     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
```

```
  436  002216  020027  000040          5$:     CMP     R0,#40          ;CHECK IF A SPACE
  437  002222  001002                          BNE     6$              ;BRANCH IF NOT A SPACE
  438  002224  104013                          READ                    ;SPACE,WAIT SOME MORE
  439  002226  000773                          BR      5$              ;GOT ONE , ECHO IT
  440  002230  012700  000036          6$:     MOV     #36,,R0         ;DELAY FOR HALF DUPLEX
  441  002234  104003                          DELAY
  442  002236  013700  001124                  MOV     TEMPCH,R0       ;GET CHAR
  443  002242  104021                          ECHO                    ;ECHO CHAR
  444  002244  042700  000040                  BIC     #BIT5,R0        ;ALLOW LOWER CASE OR UPPER CASE
  445  002250  020027  000114                  CMP     R0,#114         ;IS IT AN "L"
  446  002254  001413                          BEQ     7$              ;BRANCH IF YES
  447  002256  020027  000123                  CMP     R0,#123         ;NO, IS IT AN "S"
  448  002262  001414                          BEQ     8$              ;BRANCH IF YES
  449  002264  023727  001124  000056          CMP     TEMPCH,#56      ;NO, IS IT A "."
  450  002272  001124                          BNE     NG              ;NO, ERROROR
  451  002274  012737  000001  001104          MOV     #1,CNTLSW       ;SET BIT 0 ONLY IN CNTLSW
  452  002302  000407                          BR      9$
  453  002304  012737  004001  001104  7$:     MOV     #4001,CNTLSW    ;SET BITS 11 AND 0
  454  002312  000403                          BR      9$
  455  002314  012737  000401  001104  8$:     MOV     #401,CNTLSW     ;SET BITS 8 AND 0
  456  002322  104017                  9$:     CLEAN                   ;CLEAN UP
  457  002324  012706  001100                  MOV     #SPBOT,SP       ;RESET S#
  458  002330  010500                          MOV     R5,R0           ;TEST NO TO R0
  459  002332  020027  000040                  CMP     R0,#40          ;CHECK IF TEST NO, IS EQ OR GT 40
  460  002336  103102                          BHIS    NG              ;ERROR IF YES
  461  002340  020027  000020                  CMP     R0,#20          ;CHECK IF THIS IS AN ECHO TEST
  462  002344  103406                          BLO     10$             ;BRANCH IF NOT
  463  002346  020027  000030                  CMP     R0,#30          ;OPTION TEST?
  464  002352  103003                          BHIS    10$             ;ALLOW LOOP ON OPTION TEST
  465  002354  012737  000001  001104          MOV     #1,CNTLSW       ;YES, FORCE TO ONE TIME ONLY
  466  002362  006300                  10$:    ASL     R0              ;TEST NO, * 2
  467  002364  016037  003156  001110          MOV     PRGTAB(R0),NXTST;ADDR OF TEST TO NXTST
  468  002372  001464                          BEQ     NG              ;BRANCH IF ILLEGAL TEST
  469  002374  104016                          FORWD                   ;SET UP TEST PARAMETERS
  470  002376  012737  000001  001222          MOV     #1,ACTIV        ;SET TEST ACTIVE IND
  471  002404  000177  176510                  JMP     @CURTST         ;GO TO TEST
  472  002410  017700  176524          TTY1G:  MOV     @NRCRA,R0       ;TEST ACTIVE,CHECK INPUT FROM DH11
  473  002414  100040                          BPL     TTY1L           ;BRANCH IF NO DATA
  474  002416  010004                          MOV     R0,R4           ;DATA, SAVE IT
  475  002420  000300                          SWAB    R0              ;RIGHT JUSTIFY LINE NO;
  476  002422  042700  177760                  BIC     #177760,R0      ;CLEAR ALL BUT LINE NO;
  477  002426  020037  001156                  CMP     R0,LINENO       ;CHECK IF LINE NO, IS SAME AS TEST LINE
  478  002432  001366                          BNE     TTY1G           ;NOT SAME, SEE IF ANY MORE IN SILO
  479  002434  010400                          MOV     R4,R0           ;LINES ARE THE SAME, GET CHAR
  480  002436  042700  177600                  BIC     #177600,R0      ;SAVE 7 BITS OF CHAR
  481  002442  020027  000177                  CMP     R0,#177         ;CHECK IF A RUBOUT
  482  002446  001360                          BNE     TTY1G           ;NOT A RUBOUT, SEE IF ANY MORE
  483  002450  012706  001100          TTY1H:  MOV     #SPBOT,SP       ;RESET STACK
  484  002454  012737  000001  001104          MOV     #1,CNTLSW       ;CLEAR BITS 11 AND 8
  485  002462  012700  000036                  MOV     #36,,R0         ;DELAY FOR HALF DUPLEX
  486  002466  104003                          DELAY
  487  002470  104002                          TYPEM                   ;OUTPUT MESSAGE
  488  002472  017257                          MESG3
  489  002474  005037  001222                  CLR     ACTIV           ;CLEAR TEST ACTIVE STATE
```



```
  490  002500  005737  001224                  TST     IOSW            ;DJ11 OR DH11 ?
  491  002504  001402                          BEQ     1$              ;BRANCH IF DH11
  492  002506  000137  002024                  JMP     TTYJA           ;WAIT FOR NEXT TEST FROM DJ11
  493  002512  000137  002054          1$:     JMP     TTY1A           ;WAIT FOR NEXT TEST FROM DH11
  494  002516  032737  004000  001104  TTY1L:  BIT     #BIT11,CNTLSW   ;CHECK IF LOOP ON TEST
  495  002524  001401                          BEQ     1$              ;BRANCH IF NO LOOP
  496  002526  000002                          RTI                     ;GO LOOP ON TEST
  497  002530  032737  000400  001104  1$:     BIT     #BIT8,CNTLSW    ;CHECK IF LOOP ON SEQUENCE
  498  002536  001744                          BEQ     TTY1H           ;BRANCH IF NO
  499  002540  000137  001772                  JMP     CHAINY          ;GO LOOP ON SEQUENCE
  500  002544  012700  000036          NG:     MOV     #36,,R0         ;DELAY FOR HALF DUPLEX
  501  002550  104003                          DELAY
  502  002552  112700  000077                  MOVB    #77,R0          ;"?" TO TEMPCH
  503  002556  104021                          ECHO                    ;PRINT A ?
  504  002560  000733                          BR      TTY1H           ;TRY AGAIN FROM DH11
  505
  506
  507                                   ;**********
  508                                   ;
  509                                   ;FORWARD--THIS ROUTINE TRANSFERS THE 2 ARGUMENTS
  510                                   ;       FROM THE TEST ROUTINE, THEY ARE;
  511                                   ;       1= ROUTINE NUMBER
  512                                   ;       2= ADDRESS OF NEXT TEST
  513                                   ;
  514                                   ;**********
  515
  516  002562  013705  001110          $FORWD: MOV     NXTST,R5        ;ADDR OF NEXT TEST TO R5
  517  002566  012537  001100                  MOV     (R5)+,RTNNO     ;GET NUMBER OF NEXT TEST
  518  002572  012537  001110                  MOV     (R5)+,NXTST     ;GET ADDR OF FOLLOWING TEST
  519  002576  010537  001120                  MOV     R5,CURTST       ;ENTRY POINT TO TEST IN CURTST
  520  002602  000002                          RTI                     ;EXIT
  521
  522
  523                                   ;**********
  524                                   ;
  525                                   ;SCANDH = ROUTINE TO SCAN DH CHANNELS LOOKING FOR INPUT
  526                                   ;
  527                                   ;**********
  528
  529  002604  013701  001230          SCANDH: MOV     DHCNT,R1        ;COUNT OF DH11'S TO R1
  530  002610  005037  001154                  CLR     CNTDH           ;CLEAR DH11 POSITION COUNTER
  531  002614  013700  001134                  MOV     DHADR,R0        ;ADDR OF FIRST DH11 TO R0
  532  002620  005720                          TST     (R0)+           ;ADDR OF NRCRA
  533  002622  010037  001140                  MOV     R0,NRCRA        ;SET UP NRCRA ADDRESS
  534  002626  017700  176306          1$:     MOV     @NRCRA,R0       ;GET NEXT CHAR FROM SILO
  535  002632  100410                          BMI     2$              ;BRANCH IF DATA IS PRESENT
  536  002634  005301                          DEC     R1              ;DECREMENT COUNT OF DH11'S
  537  002636  001762                          BEQ     SCANDH          ;START OVER IF ALL DONE
  538  002640  062737  000020  001140          ADD     #20,NRCRA       ;SET UP ADDR FOR NEXT DH11
  539  002646  005237  001154                  INC     CNTDH           ;INC DH11 POSITION COUNTER
  540  002652  000765                          BR      1$              ;GO CHECK NEXT DH11 ON BUS
  541  002654  010004                  2$:     MOV     R0,R4           ;SAVE LINE NO, AND CHAR
  542  002656  000207                          RTS     PC              ;RETURN
```

```
                                        ;**********
                                        ;
                                        ;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  000770                          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     CNTDH           ;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$:     DEC     R1              ;NO DATA, DEC COUNT OF DJ11
003044  001764                          BEQ     SCANDJ          ;START OVER IF ALL CHECKED
003046  062700  000010                  ADD     #10,R0          ;ADDR OF NEXT RBUF
003052  005723                          TST     (R3)+           ;INCREMENT ELTAB POINTER
003054  005237  001154                  INC     CNTDH           ;INCREMENT POS COUNTER
003060  000766                          BR      1$              ;DO NEXT DJ11
003062  010204          3$:     MOV     R2,R4           ;GET CONTENTS OF RBUF
003064  000302                          SWAB    R2
003066  042702  177760                  BIC     #177760,R2      ;SAVE ONLY THE LINE NO.
003072  010237  001156                  MOV     R2,LINENO       ;SAVE LINE NO.
003076  006302                          ASL     R2              ;LINE NO.*2
003100  062702  001162                  ADD     #BITTAB,R2      ;CAL ADDR OF LINE MASK
003104  011237  001160                  MOV     (R2),MASK       ;SAVE LINE MASK
003110  033713  001160                  BIT     MASK,(R3)       ;CHECK IF LINE EXISTS
003114  001352                          BNE     2$              ;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 TERMMINAL CURRENTLY UNDER TEST.
                                        ;
                                        ;**********

003124  010037  001140          SETDJ1: MOV     R0,NRCRA        ;SAVE ADDR FOR READ & TTY1H
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
```

```
                                        ;SBTTL  TEST ADDRESS TABLE

003156  006410                  PRSTAB: PT0                     ;DATA PATH TEST
003160  006464                          PT1                     ;PRINTER CHARACTER TEST
003162  006606                          PT2                     ;NON-PRINTING CHARACTER TEST
003164  007236                          PT3                     ;CARRIAGE RETURN TEST
003166  007356                          PT4                     ;MULTIPLE LINE FEED TEST
003170  007534                          PT5                     ;SINGLE LINE FEED TEST
003172  007740                          PT6                     ;BACKSPACE TEST
003174  010122                          PT7                     ;OVERPRINT TEST
003176  010334                          PT10                    ;PRINTING FREQUENCY SWEEP TEST
003200  010472                          PT11                    ;RIBBON FEED TEST
003202  010524                          PT12                    ;PRINTER BELL TEST
003204  000000                          OPEN                    ;SPARE FOR ADDITIONAL PRINTER TEST
003206  000000                          OPEN                    ;SPARE FOR ADDITIONAL PRINTER TEST
003210  000000                          OPEN                    ;SPARE FOR ADDITIONAL PRINTER TEST
003212  000000                          OPEN                    ;SPARE FOR ADDITIONAL PRINTER TEST
003214  010614                          PT17                    ;LIFE TEST

003216  010756                          EO20                    ;CHARACTER ECHO TEST
003220  011022                          EO21                    ;LINE ECHO TEST, FAST RATE
003222  011074                          EO22                    ;LINE ECHO TEST, SLOW RATE
003224  011360                          EO23                    ;CHARACTER/CODE ECHO TEST
003226  011702                          EO24                    ;SELECTIVE PATTERN ECHO TEST
003230  012466                          EO25                    ;BELL ECHO TEST
003232  000000                          OPEN                    ;SPARE FOR ADDITIONAL ECHO TESTS
003234  000000                          OPEN                    ;SPARE FOR ADDITIONAL ECHO TESTS

003236  012570                          TEST30                  ;SECONDARY CHARACTER SET OPTION
003240  012752                          TEST31                  ;SELECTIVE ADDRESSING OPTION
003242  013370                          TEST32                  ;AUTO ANSWER BACK OPTION
003244  014020                          TEST33                  ;FORM FEED OPTION
003246  014554                          TEST34                  ;HORIZONTAL TAB OPTION
003250  015116                          TEST35                  ;VERTICAL TAB OPTION
003252  000000                          OPEN                    ;SPARE FOR ADDITIONAL OPTION TESTS
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  011616  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$:     ROL     @SP             ;EMT ARGUMENT *2
003304  042716  177001          BIC     #177001,@SP     ;REMOVE 7 MSB
003310  062716  003332          ADD     #EMTTAB,@SP     ;FORM EMT RTN ADDRESS
003314  011616  000000          MOV     @(SP),@SP
003320  005046                  CLR     -(SP)           ;CLEAR PSW
003322  012746  003330          MOV     #3$,-(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  004026                  TYPM                    ;MESSAGE OUTPUT ROUTINE, MULTI DEVICES
003340  004056                  DLY                     ;DELAY ROUTINE
003342  002052                  TTY1                    ;DH11 CONSOLE TERMINAL CONTROL
003344  002022                  TTYJ                    ;DJ11 CONSOLE TERMINAL CONTROL
003346  004356                  SCRLF                   ;CARRIAGE RETURN, ALL TERMINALS
003350  004340                  SSCRLF                  ;CARRIAGE RETURN, CONSOLE TERMINAL
003352  004360                  SLF                     ;LINE FEED ONLY, ALL TERM'S
003354  004454                  SPRTC                   ;PRINT CHAR, ALL TERM'S
003356  004400                  SPRHDR                  ;PRINT TEST HEADER
003360  003600                  SREAD                   ;READ CHAR
003362  004370                  SCR                     ;CARRIAGE RETURN ONLY, ALL TERM'S
003364  004202                  SBTASC                  ;BINARY TO ASCII CONVERSION
003366  002562                  SFORHD
003370  001732                  SCLEAN
003372  004306                  STESTC                  ;CHECK CHAR
003374  003400                  SECHO                   ;PRINT CHAR, CONSOLE ONLY
003376  003536                  SINRDY                  ;CHECK IF READY
```

```
                                        ;SBTTL  COMMON ROUTINES

                                ;**********
                                ;
                                ;ECHO-- THIS ROUTINE ECHOS CHARACTERS ON THE TERMINAL UNDER TEST.
                                ;
                                ;**********
003400  005737  001224          SECHO:  TST     @#0SW           ;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     SECHO           ;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,@#SR        ;SET SILO OVERFLOW TO 16
003452  053777  001160  175470          BIS     MASK,@#AR       ;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 0-7 OF TEMPCH.
                                ;       CALLING SEQUENCE:
                                ;         INRDY
                                ;         NO CHAR RETURN
                                ;         VALID CHAR RETURN
                                ;
                                ;**********

003536  017700  175376          $INRDY: MOV     @#RCRA,R0       ;GET CHAR
003542  100015                          BPL     1$              ;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     @#RCRA,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  220437  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$:     MOV     R1,-(SP)        ;SAVE R1
003640  010246                          MOV     R2,-(SP)
003642  010346                          MOV     R3,-(SP)
003644  010446                          MOV     R4,-(SP)
003646  005737  001224                  TST     @#0SW           ;DH OR DJ?
003652  001005                          BNE     2$              ;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
003762  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
                            ;       UNDER 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 DELAY 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         05410    35440    15420              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
                            ;
                            ;XXXXXXXXXX




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          BTOASC: 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.
                                        ;
                                        ;**********

000340  112700  000015          SSCRLF: MOVB    #15,R0          ;SEND A CR
000344  104021                          ECHO                    ;WAIT UNTIL PRINTER IS READY
000346  112700  000012                  MOVB    #12,R0          ;SEND A LF
000352  104021                          ECHO
000354  000002                          RTI                     ;RETURN TO CALLER


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

000356  104014                  SCRLF:: CR                      ;SEND CR
000360  012700  000012          SLF:    MOV     #12,R0          ;LF TO R0
000364  104011                          PRINTC                  ;SEND IT
000366  000002                          RTI                     ;RETURN

000370  012700  000015          SCR:    MOV     #15,R0          ;CR TO R0
000374  104011                          PRINTC                  ;SEND IT
000376  000002                          RTI                     ;RETURN


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

000400  104002                  SPRHDR: TYPEM                   ;PRINT MESG
000402  017033                          HDRMSG
000404  013700  001106                  MOV     RTNNO,R0        ;GET TEST NUMBER
000410  006200                          ASR     R0              ;GET FIRST DIGIT
000412  006200                          ASR     R0
000414  006200                          ASR     R0
000416  042700  177770                  BIC     #177770,R0      ;MASK FIRST DIGIT
000422  062700  000060                  ADD     #60,R0          ;MAKE ASCII
000426  104011                          PRINTC                  ;PRINT IT
000430  013700  001106                  MOV     RTNNO,R0        ;GET TEST NUMBER AGAIN
000434  042700  177770                  BIC     #177770,R0      ;MASK LAST DIGIT
000440  062700  000060                  ADD     #60,R0          ;MAKE ASCII
000444  104011                          PRINTC                  ;PRINT IT
000446  104006                          CRLF                    ;CR-LF
000450  104010                          LF                      ;BLANK LINE
000452  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.
                                        ;
                                        ;**********

000454  010046                  SPRTC:  MOV     R0,-(SP)        ;SAVE R0
000456  010146                          MOV     R1,-(SP)        ;SAVE R1
000460  010246                          MOV     R2,-(SP)        ;SAVE R2
000462  010346                          MOV     R3,-(SP)        ;SAVE R3
000464  010446                          MOV     R4,-(SP)        ;SAVE R4
000466  010546                          MOV     R5,-(SP)        ;SAVE R5
000470  005737  001224                  TST     IOSW            ;DH11 OR DJ11?
000474  001402                          BEQ     1$
000476  000137  005324                  JMP     PRINTJ          ;GO TO DJ11 ROUTINE
000502  005737  001230          1$:     TST     DHCNT           ;ANY DH11'S PRESENT?
000506  001562                          BEQ     12$             ;RETURN IF NONE
000510  032777  020000  174526          BIT     #BIT13,@SR      ;CHECK IF SR BIT13 IS SET
000516  001445                          BEQ     6$              ;DRIVE ALL TERMINALS IF NOT SET
000520  104021                          ECHO                    ;OUTPUT CHAR
000522  104022                          INRDY                   ;CHECK IF ANY INPUT
000524  100440                          BR      18$             ;NO,RETURN
000526  023727  001124  000177          CMP     TEMPCH,#177     ;INPUT,CHECK IF A RUBOUT
000534  001402                          BEQ     2$
000536  000137  005246                  JMP     ENDITR          ;NO RUBOUT, RETURN
000542  023727  001106  000024  2$:     CMP     RTNNO,#24       ;CHECK IF TEST 24
000550  001004                          BNE     3$              ;BRANCH IF NOT
000552  012766  012054  000014          MOV     #TERM,14(SP)    ;SET RETURN ADR
000560  000535                          BR      12$             ;RETURN TO EXIT TEST PROPERLY
000562  023727  001106  000021  3$:     CMP     RTNNO,#21       ;TEST 21?
000570  001004                          BNE     4$              ;BRANCH IF NOT
000572  012766  011064  000014          MOV     #E0218,14(SP)   ;SET RETURN TO EXIT TEST PROPERLY
000600  000525                          BR      12$             ;RETURN
000602  023727  001106  000022  4$:     CMP     RTNNO,#22       ;TEST 22?
000610  001004                          BNE     5$              ;CONTINUE IF NOT
000612  012766  011144  000014          MOV     #E0228,14(SP)   ;SET RETURN ADR
000620  000515                          BR      12$             ;RETURN TO EXIT TEST PROPERLY
000622  000137  002450          5$:     JMP     TTY1H           ;GO WAIT
000626  000137  005262          18$:    JMP     ENDIT
000632  013737  001134  001232  6$:     MOV     DHADR,SCR1      ;INIT ADDR OF FIRST DH11
000640  012705  016560                  MOV     #ELTAB,R5       ;INIT ADDR TO EXISTING TERM TAB
000644  012704  015560                  MOV     #DH1100,R4      ;INIT ADDR TO VP TAB
000650  013703  001230                  MOV     DHCNT,R3        ;INIT DH11 COUNT
000654  012702  000001          7$:     MOV     #1,R2           ;INIT CURRENT LINE NO.
000660  005001                          CLR     R1              ;SET UP CURRENT CHANNEL NUMBER
000662  013737  001232  001234          MOV     SCR1,SCR2       ;SET SCR2 = ADDR OF CURRENT DH11
```

```
1098  004670  062737  000012  001234          ADD     #12,SCR2        ;SET SCR2 = ADDR OF BAR
1099  004676  031502                  8$:     BIT     @R5,R2          ;TEST IF TERMINAL EXISTS
1100  004700  001147                          BNE     17$             ;BRANCH IF NO TERMINAL
1101  004702  037702  174326          9$:     BIT     @SCR2,R2        ;TEST IF OK TO SEND
1102  004706  001375                          BNE     9$              ;TEST AGAIN
1103  004710  062737  000004  001234          ADD     #4,SCR2         ;ADDR OF SILO STATUS
1104  004716  112777  000020  174310          MOVB    #20,@SCR2       ;SET SILO OVERFLOW TO 16
1105  004724  162737  000016  001234          SUB     #16,SCR2        ;SET SCR2 AS ADDR OF SCR
1106  004732  110177  174276                  MOVB    R1,@SCR2        ;PUT CHANNEL NO, INTO SCR
1107  004736  062737  000002  001234          ADD     #2,SCR2         ;SET CHAR BUF ADR
1108  004744  005777  174264                  TST     @SCR2           ;ANY INPUT?
1109  004750  100064                          BPL     16$             ;CONTINUE IF NONE
1110  004752  017737  174256  001124          MOV     @SCR2,TEMPCH    ;GET CHAR
1111  004760  042737  177600  001124          BIC     #177600,TEMPCH  ;MASK CHAR
1112  004766  023727  001124  000177          CMP     TEMPCH,#177     ;CHECK IF RUBOUT
1113  004774  001032                          BNE     14$             ;BRANCH IF NOT RUBOUT
1114  004776  023727  001106  000024          CMP     RTNNO,#24       ;TEST 24?
1115  005004  001004                          BNE     10$             ;BRANCH IF NOT
1116  005006  012766  012054  000014          MOV     #TERM,14(SP)    ;SET RETURN ADR
1117  005014  000517                          BR      ENDITD          ;RETURN TO EXIT TEST PROPERLY
1118  005016  023727  001106  000021  10$:     CMP     RTNNO,#21       ;TEST21?
1119  005024  001004                          BNE     11$             ;BRANCH IF NOT
1120  005026  012766  011064  000014          MOV     #EQ21B,14(SP)   ;SET RETURN ADR
1121  005034  000507                          BR      ENDITD          ;RETURN TO EXIT TEST PROPERLY
1122  005036  023727  001106  000022  11$:     CMP     RTNNO,#22       ;TEST 22?
1123  005044  001004                          BNE     13$             ;BRANCH IF NOT
1124  005046  012766  011144  000014          MOV     #EQ22B,14(SP)   ;SET RETURN ADR
1125  005054  000477                  12$:    BR      ENDITD          ;RETURN TO EXIT TEST PROPERLY
1126  005056  000137  002450          13$:    JMP     TTY1H           ;CONTROL
1127  005062  023727  001124  000003  14$:     CMP     TEMPCH,#3       ;CHAR = CONTROL-C ?
1128  005070  001004                          BNE     15$             ;CONTINUE IF NOT
1129  005072  023727  001106  000024          CMP     RTNNO,#24       ;TEST 24?
1130  005100  001465                          BEQ     ENDITD          ;EXIT IF TEST 24
1131  005102  013737  001124  001114  15$:     MOV     TEMPCH,REPT     ;SAVE CHAR FOR TESTS 21 AND 22
1132  005110  010046                          MOV     R0,-(SP)        ;SAVE R0
1133  005112  012700  000036                  MOV     #30.,R0         ;DELAY FOR HALF DUPLEX
1134  005116  104003                          DELAY
1135  005120  012600                          MOV     (SP)+,R0        ;RESTORE R0
1136  005122  062737  000002  001234  16$:     ADD     #2,SCR2         ;SCR2 EQ ADDR OF LPR
1137  005130  011477  174100                  MOV     (R4),@SCR2      ;STORE VP INTO LPR
1138  005134  062737  000002  001234          ADD     #2,SCR2         ;ADD 2 TO ADDDR IN SCR2
1139  005142  010146                          MOV     R1,-(SP)        ;SAVE R1
1140  005144  006301                          ASL     R1              ;FIND TABLE POINTER
1141  005146  006301                          ASL     R1              ;TO STORE CHAR
1142  005150  006301                          ASL     R1              ;FOR THIS CHANNEL
1143  005152  006301                          ASL     R1
1144  005154  060301                          ADD     R3,R1
1145  005156  062701  006007                  ADD     #CHARAC-1,R1
1146  005162  110011                          MOVB    R0,(R1)         ;STORE CHAR
1147  005164  010177  174044                  MOV     R1,@SCR2        ;ADDR OF CHAR INTO CARA
1148  005170  012601                          MOV     (SP)+,R1        ;RESTORE R1
1149  005172  062737  000002  001234          ADD     #2,SCR2         ;ADD 2 TO ADDR IN SCR2
1150  005200  012777  177777  174026          MOV     #177777,@SCR2   ;SET CHAR COUNT EQ 1
1151  005206  062737  000002  001234          ADD     #2,SCR2         ;ADD 2 TO ADDR IN SCR2
```



```
1152  005214  050277  174014                  BIS     R2,@SCR2        ;SET LINE BIT IN BAR
1153  005220  005724                  17$:    TST     (R4)+           ;INC PTR TO VPTSB FOR NEXT TERM
1154  005222  005201                          INC     R1              ;INCREMENT CHANNEL NO,
1155  005224  006302                          ASL     R2              ;ROTATE LINE NO, MASK TO NEXT POS,
1156  005226  103223                          BCC     8$              ;DO NEXT TERM, ON SAME DH11
1157  005230  005303                          DEC     R3              ;DEC COUNT OF DH11'S
1158  005232  001413                          BEQ     ENDIT           ;BRANCH IF ALL DONE
1159  005234  062737  000020  001232          ADD     #20,SCR1        ;SET UP FOR NEXT DH11
1160  005242  005725                          TST     (R5)+           ;INC PTR TO EXISTING TERM, TBL,
1161  005244  000603                          BR      7$              ;DO NEXT DH11
1162
1163
1164  005246  013737  001124  001114  ENDITR: MOV     TEMPCH,REPT     ;SAVE CHAR FOR TESTS 21 & 22
1165  005254  012700  000036         ENDITD: MOV     #30.,R0         ;DELAY FOR HALF DUPLEX
1166  005260  104003                          DELAY
1167
1168  005262  012605                  ENDITI: MOV     (SP)+,R5
1169  005264  012604                          MOV     (SP)+,R4
1170  005266  012603                          MOV     (SP)+,R3
1171  005270  012602                          MOV     (SP)+,R2
1172  005272  012601                          MOV     (SP)+,R1
1173  005274  012600                          MOV     (SP)+,R0
1174  005276  023727  001124  000003          CMP     TEMPCH,#3       ;CHAR = CONTROL C ?
1175  005304  001006                          BNE     1$              ;EXIT IF NOT
1176  005306  023727  001106  000024          CMP     RTNNO,#24       ;TEST 24?
1177  005314  001002                          BNE     1$              ;EXIT IF NOT
1178  005316  012716  011770                  MOV     #EQ24R,(SP)     ;YES, SET RETURN ADR
1179  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     ENDITR          ;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     #EQ21B,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     #EQ22B,14(SP)   ;SET RETURN ADR
005436  000706                          BR      ENDITD          ;RETURN TO EXIT TEST PROPERLY
005440  000137  002450          3$:     JMP     TTY1H           ;GO WAIT
005444  012737  160010  001232  4$:     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  132502                          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  012054  000014          MOV     #TERM,14(SP)    ;SET RETURN ADR
005600  000625                          BR      ENDITD          ;RETURN TO EXIT TEST PROPERLY
005602  023727  001106  000021  7$:     CMP     RTNNO,#21       ;TEST 21?
005610  001004                          BNE     8$              ;BRANCH IF NOT
005612  012766  011064  000014          MOV     #EQ21B,14(SP)   ;SET RETURN ADR
005620  000615                          BR      ENDITD          ;RETURN TO EXIT TEST PROPERLY
005622  023727  001106  000022  8$:     CMP     RTNNO,#22       ;TEST 22?
005630  001004                          BNE     12$             ;BRANCH IF NOT
005632  012766  011144  000014          MOV     #EQ22B,14(SP)   ;SET RETURN ADR
005640  000605                  9$:     BR      ENDITD          ;RETURN TO EXIT TEST PROPERLY
005642  000137  002450          10$:    JMP     TTY1H           ;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  001114  001124  12$:    MOV     TEMPCH,REP?     ;SAVE CHAR FOR TESTS 21 & 22
005674  010046                          MOV     R0,-(SP)        ;SAVE R0
005676  012700  000036                  MOV     #30.,R0         ;DELAY FOR HALF DUPLEX
005702  104003                          DELAY
005704  012600                          MOV     (SP)+,R0        ;RESTORE R0
005706  162737  000002  001234          SUB     #2,SCR2         ;RESET PROPER ADR FOR PRINT
005714  052777  000400  173312  13$:    BIS     #BIT8,@SCR2     ;START TRANSMITTER SCANNER
005722  105777  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  001246                          BNE     6$              ;BRANCH IF NOT, TRY AGAIN
005754  110077  173254                  MOVB    R0,@SCR2        ;LOAD TBUF WITH CHAR
005760  005201                  15$:    INC     R1              ;INCREMENT LINE NO'
005762  006302                          ASL     R2              ;SET LINE NO' TO NEXT POSITION
005764  103241                          BCC     6$              ;IF CARRY IS CLEAR DJ11 IS DONE
005766  005303                          DEC     R3              ;DEC COUNT OF DJ11S
005770  001002                          BNE     16$             ;BRANCH IF NOT DONE
005772  000137  005262                  JMP     ENDIT           ;DONE
005776  062737  000010  001232  16$:    ADD     #10,SCR1        ;SET SCR1 TO ADDR OF NEXT DJ11
006004  005725                          TST     (R5)+           ;SET R5 TO NEXT ELTAB ENTRY
006006  000625                          BR      5$              ;GO DO NEXT DJ11


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

```
                                        ;SBTTL  PRINTER TESTS


                                        ;XXXXXXXXXX
                                        ;
                                        ;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*
                                        ;
                                        ;XXXXXXXXXX

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                        HDR0
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          SPC:  MOV     #40,R0          ;SPACE TO R0
006602  104011                      PRINTC                  ;PRINT SECOND SPACE
006604  000207                      RTS     PC              ;RETURN
```

```
                                        ;XXXXXXXXXX
                                        ;
                                        ;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.
                                        ;
                                        ;XXXXXXXXXX

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,SP2          ;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
```



```
006764  001375                          BNE     12$             ;BRANCH IF NOT ZERO
006766  104006                          CRLF                    ;SEND A CR, LF
006770  104001                          CHAIN                   ;CHAIN TO NEXT TEST
006772  000710                          BR      1$              ;REPEAT TEST


006774  030060  020060  047040  LINE2:  .ASCII  /000 NUL001 SOH002 STX/
007002  046125  030060  020061
007010  051440  044117  030060
007016  020062  051440  054124
007024  030060  020066  040440          .ASCII  /006 ACK020 DLE021 DC1/
007032  045503  031060  020060
007040  042040  042514  031060
007046  020061  042040  030503
007054  031060  020062  042040          .ASCII  /022 DC2023 DC3024 DC4/
007062  031103  031060  020063
007070  042040  031503  031060
007076  020064  042040  032103
007104  031060  020065  047040          .ASCII  /025 NAK026 SYN027 ETB/
007112  045501  031060  020066
007120  051440  047131  031060
007126  020067  042440  041124
007134  031460  020060  041440          .ASCII  /030 CAN031 EM 032 SUB/
007142  047101  031460  020061
007150  042440  020115  031460
007156  020062  051440  041125
007164  031460  020064  043040          .ASCII  /034 FS 035 GS 036 RS /
007172  020123  031460  020065
007200  043440  020123  031460
007206  020066  051040  020123
007214  031460  020067  052440          .ASCII  /037 US 177 DEL /
007222  020123  033461  020067
007230  042040  046105    040
                007236                  .EVEN
```

```
                                        ;XXXXXXXXXX
                                        ;
                                        ;PT3 -- CARRIAGE RETURN TEST --
                                        ;       THE LINE CONSISTS OF A STRING OF 0'S AND
                                        ;       X'S.  FIRST, THE 0'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  007396                        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         ;"0" TO R0
007260  104011                        PRINTC                  ;PRINT THE "0"
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                        PTB                     ;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  032460  031060  032060  LINE3:  .ASCII  /0I0204081632 00/
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  000427                          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$:     MOV     #2,R3           ;# COUNT TO R3
010134  013701  001112          2$:     MOV     WIDTH,R1        ;NO. OF COLUMNS TO R1
010140  012700  000115          3$:     MOV     #'M,R0          ;PRINT M
010144  104011                          PRINTC
010146  005301                          DEC     R1              ;END OF LINE
010150  001404                          BEQ     4$              ;BRANCH IF YES
010152  004737  006576                  JSR     PC,$PC          ;SEND SPACE
010156  005301                          DEC     R1              ;END OF LINE?
010160  001367                          BNE     3$              ;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,$PC          ;SEND SPACE
010216  005301                          DEC     R1              ;DECREASE COLUMN COUNT
010220  001405                          BEQ     9$              ;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,$PC          ;SEND SPACE
010302  005301                          DEC     R1              ;DECREASE COLUMN COUNT
010304  001367                          BNE     13$             ;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
```

```
                                        ;XXXXXXXXXX
                                        ;
                                        ;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 )
                                        ;
                                        ;XXXXXXXXXX

010334  000010                          PT$01:  10                      ;TEST NUMBER
010336  010472                                  PT$1                    ;NEXT TEST
010340  104012                                  PRTHDR                  ;PRINT TEST HEADER
010342  012701  000036          1$:     MOV     #30,R1                  ;SET R1=30
010346  012702  000170                  MOV     #120.,R2                ;SET CHAR COUNT = 120
010352  012737  000036  010370          MOV     #30.,35$2               ;SET UP DELAY VALUE
010360  012700  000110          2$:     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     35$2,R4                 ;GET OLD DELAY
010410  006204                          ASR     R4                      ;CAL 1/16 OF OLD DELAY
010412  006204                          ASR     R4
010414  006204                          ASR     R4
010416  006204                          ASR     R4
010420  010405                          MOV     R4,R5                   ;SAVE 1/16 IN R5
010422  006204                          ASR     R4                      ;CAL 1/128 OF OLD DELAY
010424  006204                          ASR     R4
010426  006204                          ASR     R4
010430  060405                          ADD     R4,R5                   ;1/16 +1/128 TO R5
010432  022702  000074                  CMP     #60.,R2                 ;TEST WHICH HALF OF THE 120 CHARS',
010436  003403                          BLE     5$                      ;BRANCH IF LT OR EQ 60
010440  160537  010370                  SUB     R5,35$2                 ;GT 51, DECREASE DELAY BY 34 MEC,
010444  000745                          BR      2$                      ;GO PRINT AGAIN
010446  060537  010370          5$:     ADD     R5,35$2                 ;LT HALF WAY, ADD DELAY OF 34 MEC',
010452  000742                          BR      2$                      ;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
```



```
                                        ;XXXXXXXXXX
                                        ;
                                        ;PT11-- 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 FEED MECHANISM FOR PROPER OPERATION.
                                        ;
                                        ;XXXXXXXXXX

010472  000011                          PT$11:  11                      ;TEST NUMBER
010474  010524                                  PT$12                   ;NEXT TEST
010476  104012                                  PRTHDR                  ;PRINT TEST HEADER
010500  012701  000030          1$:     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  104001                          CHAIN                           ;CHAIN TO NEXT TEST
010522  000766                          BR      1$                      ;REPEAT TEST


                                        ;XXXXXXXXXX
                                        ;
                                        ;PT12--  PRINTER BELL TEST-- THE LAST TEST IN THE
                                        ;       PRINTER TEST SEQUENCE;  THIS TEST OUTPUTS
                                        ;       EIGHT BELL SIGNALS TO THE PRINTER
                                        ;
                                        ;XXXXXXXXXX

010524  000012                          PT$12:  12                      ;THIS TEST
010526  006410                                  PT0                     ;NEXT TEST
010530  104012                                  PRTHDR                  ;PRINT TEST HEADER
010532  012701  000010          PT12A:  MOV     #10,R1                  ;COUNTER TO R1
010536  012700  000007          1$:     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  104001          HERE:   CHAIN                                   ;CHAIN TO NEXT TEST
010602  000753                          BR      PT12A                   ;REPEAT TEST
```

```
                                        ;XXXXXXXXXX
                                        ;
                                        ;P%17-%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.
                                        ;
                                        ;XXXXXXXXXX

010604  000017                PT17B:  17                      ;TEST NUMBER
010606  010604                        PT17B                   ;NEXT TEST
010610  000137  010626                JMP     PTE7D           ;CONTINUE
010614  000017                PTE71:  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  PTE7D1: MOV     #41,REPT        ;SET START CHAR
010634  013701  001112          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  001112          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  104002                        TYPEM                   ;TYPE PASS COUNT
010746  016727                        ENDPAS
010750  104001                        CHAIN                   ;REPEAT TEST
010752  000725                        BR      PTE7D

010754  000000          PASCNT: 0
```



```
                                        .SBTTL  ECHO TESTS
                                        ;XXXXXXXXXX
                                        ;
                                        ;E%20-% 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.
                                        ;
                                        ;XXXXXXXXXX

010756  000020                E%20:   20                      ;TEST NUMBER
010760  011022                        E021                    ;NEXT TEST
010762  104012                        PRTHDR                  ;PRINT TEST HEADER
010764  104013                1$:     READ                    ;GO WAIT FOR KEYBOARD INPUT
010766  012700  000036                MOV     #36.,R0         ;DELAY FOR HALF DUPLEX
010772  104003                        DELAY
010774  013700  001124                MOV     TEMPCH,R0       ;GET CHAR
011000  022700  000177                CMP     #177,R0         ;CHECK IF RUBOUT
011004  001402                        BEQ     2$              ;BRANCH IF YES
011006  104021                        ECHO                    ;NO, CHECK PRINTER READY
011010  000765                        BR      1$
011012  104002                2$:     TYPEM                   ;PRINT TERMINATION MESSAGE
011014  017210                        E20END
011016  104001                        CHAIN                   ;CHAIN TO NEXT TEST
011020  000761                        BR      1$              ;REPEAT TEST
```

```
                                        ;XXXXXXXXXX
                                        ;
                                        ;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 BY THE
                                        ;        RUBOUT.
                                        ;
                                        ;XXXXXXXXXX

011022  000021                  E0211   21                      ;TEST NUMBER
011024  011074                          E022                    ;NEXT TEST
011026  104012                          PRTHDR                  ;PRINT TEST HEADER
011030  012737  000060  001114  E0211A: MOV     #60,REPT        ;CHARACTER TO BE REPEATED (0)
011036  013737  001112  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  104002                  E0218:  TYPEM                   ;PRINT TERMINATION MESG
011066  017210                          ECOEND
011070  104001                          CHAIN                   ;CHAIN TO NEXT TEST
011072  000756                          BR      E021A           ;REPEAT TEST
```



```
                                        ;XXXXXXXXXX
                                        ;
                                        ;E0220--  LINE ECHO TEST, SLOW RATE--  SAME AS E021 EXCEPT
                                        ;        THAT A DELAY IS INTRODUCED BETWEEN CHARACTERS
                                        ;        TO PRODUCE AN LGV ACTION
                                        ;
                                        ;XXXXXXXXXX

011074  000022                  E0221   22
011076  011360                          E023
011100  104012                          PRTHDR                  ;PRINT TEST HEADER
011102  012737  000060  001114  E022A1: 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  104002                  E0228:  TYPEM                   ;PRINT TERMINATION MESSAGE
011146  017210                          ECOEND
011150  104001                          CHAIN                   ;CHAIN TO NEXT TEST
011152  000753                          BR      E022A           ;REPEAT TEST
```

```
                                        ;********
                                        ;
                                        ;       THIS FOLLOWING TABLE IS USED BY TEST 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  /S#  /

                                        ;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

                                E023:   23                      ;TEST NUMBER
                                        E024                    ;NEXT TEST
                                        PRTHDR                  ;PRINT TEST HEADER
                                1$:     READ                    ;GO WAIT FOR CHARACTER
000036                                  MOV     #30,,R0         ;DELAY FOR HALF DUPLEX
                                        DELAY
000041                                  CMP     TEMPCH,#41      ;TEST IF CHAR IS PRINTABLE
                                        BHIS    3$              ;BRANCH IF IT IS
011542                                  JSR     PC,STRLN        ;STORE CODE INTO MESSAGE
001124                                  MOV     TEMPCH,R0       ;GET CODE AGAIN
                                        ASL     R0              ;MULT BY 2
                                        ASL     R0              ;MULT BY 4
011154                                  ADD     #MONIC,R0       ;ADD ADDR OF MNEMONIC TABLE
011620                                  JSR     PC,MOVNUM       ;MOV MNEMONIC TO MESSAGE
                                2$:     TYPE                    ;TYPE CODE AND MNEMONIC
                                        E023M                   ;ADDRESS OF MESSAGE
                                        BR      1$              ;GO WAIT FOR NEXT CHARACTER
000177                          3$:     CMP     TEMPCH,#177     ;TEST IF CHAR IS A RUBOUT
                                        BEQ     4$              ;BRANCH IF RUBOUT
011672                                  MOV     #M024,R1
001124                                  MOVB    TEMPCH,(R1)+
000040                                  MOVB    #40,(R1)+
000040                                  MOVB    #40,(R1)+
000040                                  MOVB    #40,(R1)+
011542                                  JSR     PC,STRLN        ;STORE CODE INTO MESSAGE
011672                                  MOV     #M024,R0        ;ADDR OF CHAR INTO R0
011620                                  JSR     PC,MOVNUM       ;MOVE CHAR INTO MESSAGE
000750                                  BR      2$              ;TYPE MESSAGE
011542                          4$:     JSR     PC,STRLN        ;RUBOUT, CONVERT AND STOR CODE
011676                                  MOV     #M025,R0        ;ADDR, OF DEL INTO R0
011620                                  JSR     PC,MOVNUM       ;MOVE DEL INTO MESSAGE
                                        TYPE                    ;TYPE MESSAGE
                                        E023M                   ;ADDR OF MESSAGE
                                        TYPEM
                                        ECOEND
                                        CHAIN                   ;CHAIN TO NEXT TEST
000712                                  BR      1$              ;REPEAT TEST
```

```
 2029  011542  012702  000003          STRLN1  MOV     #3,R2           ;COUNT OF 3 TO R2
 2030  011546  012701  017241                  MOV     #LINE3,R1       ;ADDR OF MESG TO R1
 2031  011552  062701  000003                  ADD     #3,R1           ;POINT TO LAST SPACE IN MESG
 2032  011556  013700  001130          1$:     MOV     PCHAR,R0        ;MOVE OCTAL CODE TO R0
 2033  011562  042700  177770                  BIC     #177770,R0      ;SAVE LS OCTAL CHAR,
 2034  011566  062700  000060                  ADD     #60,R0          ;MAKE ASCII
 2035  011572  110041                  MOVB    R0,-(R1)        ;MOVE INTO MESG
 2036  011574  005302                  DEC     R2              ;DECREMENT CHAR COUNTER
 2037  011576  001407                  BEQ     2$              ;BRANCH IF 3 MOVED
 2038  011600  006237  001130          ASR     PCHAR           ;NOT THREE, SHIFT NEXT OCTAL
 2039  011604  006237  001130          ASR     PCHAR           ;CHARACTER TO THE RIGHT
 2040  011610  006237  001130          ASR     PCHAR           ;
 2041  011614  000760                  BR      1$              ;CONVERT AND STORE NEXT CHAR,
 2042  011616  000207          2$:     RTS     PC              ;RETURN TO CALLER
 2043
 2044
 2045  011620  012701  017245          MOVNUM: MOV     #LINE3A,R1      ;ADDR OF LINES IN R1
 2046  011624  012702  000004                  MOV     #4,R2           ;COUNT OF 3 TO R2
 2047  011630  112021          1$:     MOVB    (R0)+,(R1)+     ;MOV 3 CHARS TO MESG AREA
 2048  011632  005302                  DEC     R2              ;DECREMENT COUNTER
 2049  011634  001375                  BNE     1$              ;BRANCH IF NOT ALL DONE
 2050  011636  105737  001126          TSTB    PARITY          ;TEST PARITY FLAG
 2051  011642  001003                  BNE     2$              ;BRANCH IF ODD PARITY
 2052  011644  012700  017302          MOV     #EVEN,R0        ;SET MESSAGE FOR EVEN PARITY
 2053  011650  000402                  BR      3$              ;CONTINUE
 2054  011652  012700  017306  2$:     MOV     #ODD,R0         ;SET MESSAGE FOR ODD PARITY
 2055  011656  012702  000004  3$:     MOV     #4,R2           ;SET WORD COUNT
 2056  011662  112021          4$:     MOVB    (R0)+,(R1)+     ;MOVE CHAR TO MESSAGE
 2057  011664  005302                  DEC     R2              ;DEC CHAR COUNT
 2058  011666  001375                  BNE     4$              ;CONTINUE
 2059  011670  000207                  RTS     PC              ;RETURN
 2060
 2061  011672  020040  020040          MG24:   .ASCII  /    /          ;SAVE CHARACTER CODE
 2062
 2063                                   .EVEN
 2064
 2065  011676  042504  020114          MG25:   .ASCII  /DEL /          ;MNEMONIC FOR RUBOUT
 2066
 2067                                   .EVEN
```



```
 2068                                   ;XXXXXXXXXX
 2069                                   ;
 2070                                   ;EQ24--- SELECTED PATTERN ECHO TEST--- SELECT 1 TO 256
 2071                                   ;       CHARACTERS,  EACH WILL BE ECHOED
 2072                                   ;       AND STORED UNTIL THE CNTL/C IS SELECTED,
 2073                                   ;       AT THAT TIME ALL CHARACTERS WILL BE PRINTED AS
 2074                                   ;       A CONTINOUS STRING UNTIL EITHER THE RUBOUT IS
 2075                                   ;       SELECTED TO TERMINATE OR THE CNTL/C IS SELECTED
 2076                                   ;       AGAIN.  A TERMINATING CNTL/C FOLLOWED BY A CNTL/C WILL ALWAYS
 2077                                   ;       CAUSE THE LAST INPUTTED STRING TO BE REPEATED, A TERMINATING
 2078                                   ;       CNTL/C FOLLOWED BY SOME OTHER CHARACTER WILL START A NEW
 2079                                   ;       STRING.
 2080                                   ;
 2081                                   ;XXXXXXXXXXX
 2082
 2083  011702  000024                  EQ24:   24                      ;TEST NUMBER
 2084  011704  012466                          EQ25                    ;NEXT TEST
 2085  011706  104012                          PRTHDR                  ;PRINT TEST HEADER
 2086  011710  005001                  EQ24B:  CLR     R1              ;CLEAR CHARACTER COUNT
 2087  011712  012702  012064                  MOV     #BUFR,R2        ;ADDRESS OF BUFFER TO R2
 2088  011716  104013          1$:     READ                    ;WAIT FOR INPUT
 2089  011720  012700  000036                  MOV     #30.,R0         ;DELAY FOR HALF DUPLEX
 2090  011724  104003                          DELAY
 2091  011726  022737  000177  001124          CMP     #177,TEMPCH     ;TEST IF RUBOUT
 2092  011734  001447                          BEQ     TERM            ;BRANCH IF RUBOUT
 2093  011736  022737  000003  001124          CMP     #3,TEMPCH       ;TEST IF CNTL-C
 2094  011744  001416                          BEQ     OUTPUT          ;BRANCH IF CNTL-C
 2095  011746  020127  000400                  CMP     R1,#256.        ;YES, CHECK IF CHAR CNT IS EQ, GT 256
 2096  011752  103361                          BHIS    1$              ;BRANCH IF YES, IGNORE CHAR
 2097  011754  013700  001124                  MOV     TEMPCH,R0       ;GET CHAR
 2098  011760  110022                          MOVB    R0,(R2)+        ;STORE CHAR INTO BUFFER
 2099  011762  005201                          INC     R1              ;INCREMENT CHARACTER COUNT
 2100  011764  104021                          ECHO                    ;OUTPUT CHAR
 2101  011766  000753                          BR      1$              ;GO WAIT FOR NEXT CHAR
 2102
 2103  011770  005037  001124          EQ24B1: CLR     TEMPCH          ;CLEAR CONTROL-C FROM BUFFER
 2104  011774  104006                          CRLF                    ;CONTROL-C RETURN FROM PRINT ROUTINE
 2105  011776  104010                          LF
 2106  012000  000743                          BR      EQ24B
```

```
                                        ;********
                                        ;
                                        ;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$:     MOV     #BUFR,R2        ;BUFFER ADDRESS TO R2
012026  005037  001124                  CLR     TEMPCH          ;CLEAR CONTROL-C
012032  121227  000003                  CMPB    (R2),#3         ;FIRST CHAR IN TABLE ^C ?
012036  001724                          BEQ     EQ04B           ;YES, GO LOOK FOR MORE INPUT
012040  112200                  2$:     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                          ECODEND
012060  104001                          CHAIN                   ;CHAIN TO NEXT TEST
012062  000712                          BR      EQ04B           ;REPEAT TEST

012064  000003                  BUFR:   3                       ;INITIALIZE FIRST CHAR AS CNTL-C IN TALBE
012066  000400                          .BLKB   256.            ;200 CHARACTER BUFFER
```



```
                                        ;XXXXXXXXXXX
                                        ;
                                        ;EQ25-- 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                  EQ25:   25                      ;TEST NUMBER
012470  010756                          EQ2B                    ;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                          EQ25MA                  ;ON ALL TERMIS
012510  000402                          BR      3$              ;WAIT FOR CHAR
012512  104000                  2$:     TYPE                    ;TYPE TEST MESG ON TERM
012514  017063                          EQ25MA                  ;CHARACTER WAS RECEIVED ON
012516  104013                  3$:     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$:     TYPEM                   ;TYPE ERROR MESSAGE
012556  017163                          EQ25MB
012560  104002                  5$:     TYPEM                   ;PRINT TERMINATION
012562  017210                          ECODEND
012564  104001                          CHAIN                   ;EXIT TO NEXT TEST
012566  000742                          BR      1$              ;REPEAT TEST
```

```
                                        .SBTTL  OPTION TESTS

                                ;XXXXXXXXXXXXXXX
                                ;
                                ;TEST30 -       SECONDARY CHARACTER SET OPTION
                                ;
                                ;XXXXXXXXXXXXXXX

012570  000030                  TEST30: 30
                                        TEST30
012572  012570                          PRTHDR                  ;PRINT TEST HEADER
012574  104012
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 8?
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$:     .ASCIZ  <17>/#1s/
012673     017  031043  000075 20$:    .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
```



```
                                ;XXXXXXXXXXXXXXX
                                ;
                                ;TEST31 -       SELECTIVE ADDRESSING OPTION
                                ;
                                ;XXXXXXXXXXXXXXX

012752  000031          TEST31: 31
012754  012752                  TEST31
012756  104006                  CRLF                    ;SEND CRLF
012760  013700  013542          MOV     34$,R0          ;SET EOT CHAR
012764  104011                  PRINTC                  ;SEND IT
012766  104002  013372          TYPEM,  10$             ;TRY PRINTING ERROR MESG
012772  012700  000007          MOV     #7,R0           ;SET BEL CHAR
012776  104011                  PRINTC                  ;SEND IT
013000  012700  000002          MOV     #2,R0           ;SET STX CHAR
013004  104011                  PRINTC                  ;SEND IT
013006  104012                  PRTHDR                  ;PRINT TEST HEADER ON ALL TERMINALS
013010  013700  013542          MOV     34$,R0          ;SET EOT CODE
013014  104011                  PRINTC                  ;SEND IT
013016  012700  000002          MOV     #2,R0           ;SET STX CODE
013022  104011                  PRINTC                  ;SEND IT
013024  104002  013372          TYPEM,  10$             ;TRY PRINT ERROR MESG
013030  012703  013520          MOV     #30$,R3         ;SET TABLE POINTER
013034  005713          1$:     TST     (R3)            ;CHECK TABLE POINTER
013036  001416                  BEQ     2$              ;NEXT PORTION OF TEST IF DONE
013040  013700  013542          MOV     34$,R0          ;SEND EOT CHAR
013044  104011                  PRINTC
013046  011300                  MOV     (R3),R0         ;SEND GROUP SELECT CHAR
013050  104011                  PRINTC                  ;SEND IT
013052  012700  000002          MOV     #2,R0           ;SEND STX CHAR
013056  104011                  PRINTC
013062  104002  013436          TYPEM,  14$             ;TYPE MESG
013064  012300                  MOV     (R3)+,R0        ;TYPE SELECT CHAR FOR MESG
013066  104011                  PRINTC
013070  104006                  CRLF                    ;CR-LF
013072  000760                  BR      1$              ;CONTINUE - NEXT SELECT CHAR
013074  012703  013546  2$:     MOV     #40$,R3         ;SET TABLE ADR
013100  005713          3$:     TST     (R3)            ;CHECK SELECT CHAR
013102  001517                  BEQ     4$              ;CONTINUE TEST
013104  013700  013542          MOV     34$,R0          ;SEND EOT CHAR
013110  104011                  PRINTC                  ;ALL TERMS OFF
013112  011300                  MOV     (R3),R0         ;GET UNIQUE SELECT CHAR
013114  104011                  PRINTC                  ;SEND IT - THAT TERM ON
013116  104002  013372          TYPEM,  10$             ;TRY PRINTNG ERROR MESG
013122  012700  000002          MOV     #2,R0           ;SEND STX
013126  104011                  PRINTC
013130  104002  013444          TYPEM,  15$             ;TYPE SELECT CHAR MESG
013134  011300                  MOV     (R3),R0         ;PRINT SELECT CHAR FOR MESG
013136  104011                  PRINTC
013140  104006                  CRLF
013142  104002  013463          TYPEM,  20$             ;PRINT MESG
013146  104013                  READ                    ;READ CHAR FROM SELECTED TERM
013150  012700  000036          MOV     #30.,R0         ;DELAY FOR HALF DUPLEX
013154  104003                  DELAY
```

```
 2280  013156  022737  000177  001124          CMP     #177,TEMPCH     ;CHECK CHAR
 2281  013164  001013                          BNE     5$              ;EXIT IF RUBOUT
 2282  013166  013700  013542                  MOV     34$,R0          ;ENABLE ALL TERMINALS
 2283  013172  104011                          PRINTC
 2284  013174  012700  000007                  MOV     #7,R0
 2285  013200  104011                          PRINTC
 2286  013202  012700  000002                  MOV     #2,R0
 2287  013206  104011                          PRINTC
 2288  013210  000137  002450                  JMP     TTY1H           ;GO TO KYBD CONTROL
 2289  013214  013700  001124          5$:     MOV     TEMPCH,R0       ;GET CHAR
 2290  013220  104021                          ECHO                    ;ECHO CHAR
 2291  013222  104006                          CRLF                    ;SEND CR-LF
 2292  013224  013700  013542                  MOV     34$,R0          ;SEND EOT CHAR
 2293  013230  104011                          PRINTC
 2294  013232  013700  013544                  MOV     35$,R0          ;SEND DUMMY SELECT CHAR
 2295  013236  104011                          PRINTC
 2296  013240  012700  000002                  MOV     #2,R0           ;SEND STX
 2297  013244  104011                          PRINTC
 2298  013246  104002  013372                  TYPEM,  10$             ;TRY PRINTING ERROR MESSAGE
 2299  013252  012700  000003                  MOV     #3,R0           ;SEND ETX
 2300  013256  104011                          PRINTC
 2301  013260  011300                          MOV     (R3),R0         ;SEND UNIQUE SELECT CHAR
 2302  013262  104011                          PRINTC
 2303  013264  012700  000002                  MOV     #2,R0           ;SEND STX
 2304  013270  104011                          PRINTC
 2305  013272  104002  013444                  TYPEM,  15$             ;PRINT SELECT MESG ON SELECTED TERMINAL
 2306  013276  011300                          MOV     (R3),R0         ;PRINT SELECT CHAR FOR MESG
 2307  013300  104011                          PRINTC
 2308  013302  104006                          CRLF                    ;SEND CR-LF
 2309  013304  012700  000003                  MOV     #3,R0           ;SEND ETX
 2310  013310  104011                          PRINTC
 2311  013312  012700  013544                  MOV     #35$,R0         ;SEND DUMMY SELECT CHAR
 2312  013316  104011                          PRINTC
 2313  013320  012700  000002                  MOV     #2,R0           ;SEND STX
 2314  013324  104011                          PRINTC
 2315  013326  104002  013444                  TYPEM,  15$             ;PRINT MESG ON SELECTED TERM
 2316  013332  012300                          MOV     (R3)+,R0        ;PRINT SELECT CHAR FOR MESG
 2317  013334  104011                          PRINTC
 2318  013336  104006                          CRLF                    ;SEND CR-LF
 2319  013340  000657                          BR      3$              ;CONTINUE
 2320  013342  013700  013542          4$:     MOV     34$,R0          ;ENABLE ALL LINES
 2321  013346  104011                          PRINTC                  ;BEFORE EXITING TEST
 2322  013350  012700  000007                  MOV     #7,R0
 2323  013354  104011                          PRINTC
 2324  013356  012700  000002                  MOV     #2,R0
 2325  013362  104011                          PRINTC
 2326  013364  104001                          CHAIN                   ;CHAIN TO NEXT TEST OR LOOP ON TEST
 2327  013366  000137  012752                  JMP     TEST31          ;LOOP ON TEST
```



```
 2328  013372  051105  047522  026122  10$:    .ASCIZ  /ERROR, ALL TERMINALS SHOULD BE OFF/<ACRLF>
 2329  013400  040440  046114  052040
 2330  013406  051105  044515  040516
 2331  013414  051514  051440  047510
 2332  013422  046125  020104  042502
 2333  013430  047440  043106  000200
 2334  013436  051107  052517  020120  14$:    .ASCII  /GROUP /
 2335  013444  042523  042514  052103  15$:    .ASCIZ  /SELECT CHAR # /
 2336  013452  041440  040510  020122
 2337  013460  020075    000
 2338  013463     124  050131  020105  20$:    .ASCIZ  /TYPE ANY PRINTABLE CHAR !!! /
 2339  013470  047101  020131  051120
 2340  013476  047111  040524  046102
 2341  013504  020105  044103  051101
 2342  013512  027040  027056  000040
 2343
 2344                                          .EVEN
 2345  013520  000107                  30$:    107                     ;GROUP SELECT CHAR TABLE
 2346  013522  000000                          0                       ;FIRST ZERO = END OF TABLE
 2347  013524  000000                          0
 2348  013526  000000                          0
 2349  013530  000000                          0
 2350  013532  000000                          0
 2351  013534  000000                          0
 2352  013536  000000                          0
 2353  013540  000000                          0
 2354
 2355  013542  000004                  34$:    004                     ;DESELECT CHAR = "EOT"
 2356
 2357  013544  000045                  35$:    045                     ;DUMMY SELECT CHARACTER,
 2358                                          ;IF "%" IS USED AS A UNIQUE OR GROUP SELECT
 2359                                          ;CHARACTER, REPLACE WITH ANY UNUSED SELECT
 2360                                          ;CHARACTER CODE.
 2361
 2362  013546  000125                  40$:    125                     ;UNIQUE SELECT CHAR TABLE
 2363  013550  000000                          0                       ;FIRST ZERO = END OF TABLE
 2364  013552  000000                          0
 2365  013554  000000                          0
 2366  013556  000000                          0
 2367  013560  000000                          0
 2368  013562  000000                          0
 2369  013564  000000                          0
 2370  013566  000000                          0
```

```
                                        ;XXXXXXXXXXXXXXX
                                        ;
                                        ;TEST32 =       AUTO ANSWER BACK OPTION
                                        ;
                                        ;XXXXXXXXXXXXXXX

013570  000032                  TEST32: 32
013572  013570                          TEST32
013574  104412                          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$:    MOV     #STORE,R2       ;SET TABLE ADR
                                        READ                    ;READ FIRST CHAR
013642  023727  001124  000177  8$:     CMP     TEMPCH,#177     ;CHAR = RUBOUT?
013650  001002                          BNE     3$              ;CONTINUE IF NOT RUBOUT
013652  000137  002450                  JMP     TTY1H           ;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                  5$:     INRDY                   ;ANY INPUT?
013674  000401                          BR      6$              ;NO, WAIT FOR CHAR
013676  000761                          BR      8$              ;YES, READ CHAR
013700  005301                  6$:     DEC     R1              ;DELAY WHILE WAITING FOR CHAR
013702  001373                          BNE     5$
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$:    .ASCIZ  /DEPRESS HERE IS KEY/<ACRLF>
013730  020123  042510  042522
013736  044440  020123  042513
013744  100131     000
013747     104  050105  042522  30$:    .ASCIZ  /DEPRESS CONTROL-E/<ACRLF>
013754  051523  041440  047117
013762  051124  046117  042455
013770  000200
013772     200                          .ASCII  <ACRLF>

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

                                        .EVEN
```



```
                                        ;XXXXXXXXXXXXXXX
                                        ;
                                        ;TEST33 =       FORM FEED OPTION
                                        ;
                                        ;XXXXXXXXXXXXXXX

014020  000033                  TEST33: 33
014022  014020                          TEST33
014024  104412                          PRTHDR                  ;PRINT TEST HEADER
014026  012705  014472                  MOV     #30$,R5         ;SET TABLE POINTER
014032  012704  014456                  MOV     #60$,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     TTY1H           ;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                  MOV     R5,2$           ;SET MESG
014134  104013                  5$:     READ                    ;WAIT FOR KYBD FLAG
014136  012700  000036                  MOV     #30.,R0         ;DELAY FOR HALF DUPLEX
014142  104003                          DELAY
014144  022737  000177  001124          CMP     #177,TEMPCH     ;CHECK IF RUBOUT
014152  001002                          BNE     15$             ;EXIT IF RUBOUT
014154  000137  002450                  JMP     TTY1H           ;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
```

```
014230  104002  014271          TYPEM,  30$
014234  104002  014254          TYPEM,  10$
014240  005765  000004          TST     4(R5)           ;DONE TEST?
014244  001331                  BNE     5$              ;NO, CONTINUE
014246  104006                  CRLF                    ;YES, SEND CR-LF
014250  104001                  CHAIN                   ;SELECT TEST OR LOOP
014252  000662                  BR      TEST33          ;LOOP ON TEST
                                
014254  026455  026455  000055  10$:   .ASCIZ  /-----/
014262  020042  043106  020057  20$:   .ASCIZ  /" FF/<57>/ /
014270     000
014271     042  047040  054105  30$:   .ASCIZ  /" NEXT /
014276  020124     000
014301     104  050105  042522  40$:   .ASCII  /DEPRESS FORMFEED RESET SWITCH/<ACRLF>/AFTER EACH SWITCH SETTING/<ACRLF>
014306  051523  043040  051117
014314  043115  042505  020104
014322  042522  042523  020124
014330  053523  052111  044103
014336  040600  052106  051105
014344  042440  041501  020110
014352  053523  052111  044103
014360  051440  052105  044524
014366  043516     200
014371     124  050131  020105          .ASCII  /TYPE SPACE WHEN READY/<ACRLF>
014376  050123  041501  020105
014404  044127  047105  051040
014412  040505  054504     200
014417     055  026455  020055  45$:   .ASCIZ  /---- SET  3 INCH FORMFEED ----/
014424  042523  020124  031440
014432  044440  041516  020110
014440  047506  046522  042506
014446  042105  026440  026455
014454  000055
014456     002     005     010  60$:   .BYTE   2,5,8,,17.,20.,26.,32.,35.,50.,56.,68.
014461     021     024     032
014464     040     043     062
014467     070     104
014472                          .EVEN
                                
014472  020040  000063          90$:   .ASCII  /  3/
014476  027063  000065                 .ASCII  /35/
014502  020040  000064                 .ASCII  /  4/
014506  027065  000065                 .ASCII  /55/
014512  020040  000066                 .ASCII  /  6/
014516  020040  000067                 .ASCII  /  7/
014522  020040  000070                 .ASCII  /  8/
014526  027070  000065                 .ASCII  /85/
014532  030440  000061                 .ASCII  / 11/
014536  030440  000062                 .ASCII  / 12/
014542  030440  000064                 .ASCII  / 14/
014546  020040  000040                 .ASCII  /  /
014552  000000                         .WORD   0               ;END OF TABLE
```



```
                                ;XXXXXXXXXXXXXXX
                                ;
                                ;TEST34 =       HORIZONTAL TAB OPTION
                                ;
                                ;XXXXXXXXXXXXXXX
                                
014554  000034          TEST34: 34
014556  014554                  TEST34
014560  104012                  PRTHDR                  ;PRINT TEST HEADER
014562  005004                  CLR     R4              ;SET TABLE POINTER
014564  012737  014760  014756  1$:     MOV     #16$,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                  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                  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
```

```
 2583  014760  012737  015006  014756  169$    MOV     #19$,12$+2
 2584  014766  104014                           CR                      ;SEND CR
 2585  014770  012700  000130                   MOV     #'X,R0          ;PRINT X
 2586  014774  104011                           PRINTC
 2587  014776  013703  001112                   MOV     WIDTH,R3        ;RESET COLUMNG COUNT
 2588  015002  005303                           DEC     R3              ;SUBTRACT ONE FOR FIRST X CHAR
 2589  015004  000736                           BR      17$             ;CONTINUE
 2590  015006  104006                   15$:    CRLF                    ;SEND CR-LF
 2591  015010  005724                           TST     (R4)+           ;INC TABLE POINTER
 2592  015012  016401  015046                   MOV     20$(R4),R1      ;GET COLUMN COUNT FOR TAB
 2593  015016  001403                           BEQ     13$             ;EXIT IF DONE TABLE (0)
 2594  015020  020137  001112                   CMP     R1,WIDTH        ;CHECK IF TOO LARGE
 2595  015024  101662                           BLOS    2$              ;CONTINUE TEST, OK
 2596  015026  012700  000033           13$:    MOV     #33,R0          ;CLEAR ALL TABS BEFORE EXITING
 2597  015032  104011                           PRINTC
 2598  015034  012700  000062                   MOV     #62$,R0
 2599  015040  104011                           PRINTC
 2600  015042  104001                           CHAIN                   ;SELECT TEST OR LOOP ON TEST
 2601  015044  000643                           BR      TEST34          ;LOOP ON TEST
 2602
 2603  015046  000001  000002  000004  20$:    .WORD   1,2,4,8.,16.,32.,64.,128.,132.,0
 2604  015054  000010  000020  000040
 2605  015062  000100  000200  000204
 2606  015070  000000
 2607  015072  000001  000002  000003  30$:    .WORD   1,2,3,5,9.,18.,36.,71.,73.,0
 2608  015100  000005  000011  000022
 2609  015106  000044  000107  000111
 2610  015114  000000
```



```
 2611                                   ;XXXXXXXXXXXXXXX
 2612                                   ;
 2613                                   ;TEST35 -       VERTICAL TAB OPTION
 2614                                   ;
 2615                                   ;XXXXXXXXXXXXXXX
 2616
 2617  015116  000035                   TEST35: 35
 2618  015120  015116                           TEST35
 2619  015122  104012                           PRTHDR                  ;PRINT TEST HEADER
 2620  015124  104002                   1$:     TYPEM                   ;TYPE INSTR
 2621  015126  015437                           20$
 2622  015130  104013                           READ                    ;WAIT FOR KYBD FLAG
 2623  015132  012700  000036                   MOV     #36.,R0         ;DELAY FOR HALF DUPLEX
 2624  015136  104003                           DELAY
 2625  015140  022737  000177  001124           CMP     #177,TEMPCH     ;CHECK CHAR
 2626  015146  001505                           BEQ     12$             ;EXIT TEST IF RUBOUT
 2627  015150  005004                           CLR     R4              ;SET LINE COUNT
 2628  015152  012700  000033                   MOV     #33,R0          ;CLEAR VERTICAL TABS
 2629  015156  104011                           PRINTC
 2630  015160  012700  000064                   MOV     #64,R0
 2631  015164  104011                           PRINTC
 2632  015166  104002                   2$:     TYPEM                   ;TYPE REP LINE
 2633  015170  015415                           15$
 2634  015172  005204                           INC     R4              ;INC LINE COUNT
 2635  015174  020427  000013                   CMP     R4,#13          ;CHECK IT
 2636  015200  003013                           BGT     35$             ;BRANCH IF DONE REP.
 2637  015202  010401                           MOV     R4,R1           ;GET LF COUNT
 2638  015204  104010                   3$:     LF                      ;SEND LF
 2639  015206  005301                           DEC     R1              ;DEC LF COUNT
 2640  015210  001375                           BNE     3$              ;CONTINUE
 2641  015212  012700  000033                   MOV     #33,R0          ;SET TAB FOR THIS LINE
 2642  015216  104011                           PRINTC
 2643  015220  012700  000063                   MOV     #63,R0
 2644  015224  104011                           PRINTC
 2645  015226  000757                           BR      2$              ;CONTINUE
 2646  015230  012700  000014           35$:    MOV     #14,R0          ;SEND FF
 2647  015234  104011                           PRINTC
 2648  015236  104002                           TYPEM                   ;TYPE MESG
 2649  015240  015531                           30$
 2650  015242  104013                           READ                    ;WAIT FOR KYBD FLAG
 2651  015244  012700  000036                   MOV     #36.,R0         ;DELAY FOR HALF DUPLEX
 2652  015250  104003                           DELAY
 2653  015252  022737  000177  001124           CMP     #177,TEMPCH     ;CHECK CHAR
 2654  015260  001440                           BEQ     12$             ;EXIT TEST IF RUBOUT
 2655  015262  005004                           CLR     R4              ;RESET LF COUNT
 2656  015264  104002                   4$:     TYPEM                   ;TYPE REP LINE
 2657  015266  015414                           10$
 2658  015270  005204                           INC     R4              ;INC LINE COUNT
 2659  015272  020427  000013                   CMP     R4,#13          ;CHECK IT
 2660  015276  003014                           BGT     5$              ;BRANCH IF DONE
 2661  015300  012700  000013                   MOV     #13,R0          ;SEND TAB
 2662  015304  104011                           PRINTC
 2663  015306  010401                           MOV     R4,R1           ;SET FILL COUNT
 2664  015310  162701  000020                   SUB     #16.,R1         ;SUBTRACT 16
```

```
 2665  015314  003763                    BLE     4$              ;SKIP NULLS IF COUNT < 0
 2666  015316  005000                 6$: CLR     R0              ;SET NULL CHAR
 2667  015320  104011                    PRINTC                  ;SEND NULLS
 2668  015322  005301                    DEC     R1              ;DEC COUNT
 2669  015324  001374                    BNE     5$              ;FINISH NULLS
 2670  015326  000756                    BR      4$              ;CONTINUE
 2671  015330  012700  000033         8$: MOV     #33,R0          ;CLEAR VERTICAL TABS
 2672  015334  104011                    PRINTC
 2673  015336  012700  000064            MOV     #64,R0
 2674  015342  104011                    PRINTC
 2675  015344  012700  000014            MOV     #14,R0          ;SEND FF
 2676  015350  104011                    PRINTC
 2677  015352  104006                    CRLF                    ;SEND CR-LF
 2678  015354  104010                    LF                      ;SEND BLANK LINE
 2679  015356  104001                    CHAIN                   ;SELECT TEST OR LOOP ON TEST
 2680  015360  000656                    BR      TEST35          ;LOOP ON TEST
 2681  015362  012700  000033         12$: MOV     #33,R0          ;CLEAR ALL TABS BEFORE EXITING TEST
 2682  015366  104011                    PRINTC
 2683  015370  012700  000064            MOV     #64,R0
 2684  015374  104011                    PRINTC
 2685  015376  012700  000014            MOV     #14,R0          ;SEND FF
 2686  015402  104011                    PRINTC
 2687  015404  104006                    CRLF
 2688  015406  104010                    LF
 2689  015410  000137  002490            JMP     TTY1H           ;GO KYBD CONTROL
 2690
 2691  015414     040                 10$: .ASCII  <40>
 2692  015415     055  026455  026455  15$: .ASCIZ  /----------<<<<<<<<<</<15>
 2693  015422  026455  036055  036074
 2694  015430  036074  036074  006474
 2695  015436     000
 2696  015437     123  052105  030440  20$: .ASCII  /SET 14 INCH FORM FEED/<ACRLF>
 2697  015444  020064  047111  044103
 2698  015452  043040  051117  020115
 2699  015460  042506  042105     200
 2700  015465     104  050105  042522       .ASCIZ  /DEPRESS TOP OF FORM RESET SWITCH/<ACRLF><12><12>
 2701  015472  051523  052040  050117
 2702  015500  047440  020106  047506
 2703  015506  046522  051040  051505
 2704  015514  052105  051440  044527
 2705  015522  041524  100110  005012
 2706  015530     000
 2707  015531     001  000401  042522  30$: .ASCIZ  <15><1><1>/REMOVE /<57>/ RESET REF/
 2708  015536  047515  042526  027440
 2709  015544  051040  051505  052105
 2710  015552  051040  043105     000
 2711          015560                   .EVEN
```



```
 2712                                   .SBTTL  DH11 VARIABLE PARAMETER TABLE
 2713
 2714
 2715
 2716                                   ;**********
 2717                                   ;
 2718                                   ;DH11 PROGRAMMABLE PRAMETER TABLE
 2719                                   ;
 2720                                   ;THIS TABLE IS PROVIDED TO ALLOW THE DEGREE OF FREEDOM AVAILABLE
 2721                                   ;IN THE DH11 PROGRAMMABLE MULTIPLEXER. THERE ARE 256 ENTRIES, ONE
 2722                                   ;FOR EACH OF THE POSSIBLE 16 LINES ON EACH OF THE POSSIBLE 16
 2723                                   ;DH11'S.  EACH OF THE 256 LINES ARE INITIALIZED AS FOLLOWS:(=16707)
 2724                                   ;       CHARACTER LENGTH        = 8 BITS
 2725                                   ;       NO. OF STOP BITS        = 2
 2726                                   ;       PARITY GEN. AND DET.    NONE
 2727                                   ;       OPERATING MODE          FULL DUPLEX
 2728                                   ;       TRANSMITTER SPEED       = 300 BAUD
 2729                                   ;       RECEIVER SPEED  = 300 BAUD
 2730                                   ;
 2731                                   ;IF ANY LINE SHOULD DIFFER, THE APPROPRIATE ENTRY FOR THE LINE
 2732                                   ;SHOULD BE CHANGED BEFORE RUNNING THE DIAGNOSTIC.  REFER TO THE LINE
 2733                                   ;PARAMETER REGISTER IN THE DH11 PROGRAMMING MANUAL FOR INSTRUCTIONS.
 2734                                   ;
 2735                                   ;**********
 2736
 2737  015560                        DH11B0:
 2738  015560  016707                          .WORD   16707
 2739  015562  016707                          .WORD   16707
 2740  015564  016707                          .WORD   16707
 2741  015566  016707                          .WORD   16707
 2742  015570  016707                          .WORD   16707
 2743  015572  016707                          .WORD   16707
 2744  015574  016707                          .WORD   16707
 2745  015576  016707                          .WORD   16707
 2746  015600  016707                          .WORD   16707
 2747  015602  016707                          .WORD   16707
 2748  015604  016707                          .WORD   16707
 2749  015606  016707                          .WORD   16707
 2750  015610  016707                          .WORD   16707
 2751  015612  016707                          .WORD   16707
 2752  015614  016707                          .WORD   16707
 2753  015616  016707                          .WORD   16707
 2754  015620                        DH11B1:
 2755  015620  016707                          .WORD   16707
 2756  015622  016707                          .WORD   16707
 2757  015624  016707                          .WORD   16707
 2758  015626  016707                          .WORD   16707
 2759  015630  016707                          .WORD   16707
 2760  015632  016707                          .WORD   16707
 2761  015634  016707                          .WORD   16707
 2762  015636  016707                          .WORD   16707
 2763  015640  016707                          .WORD   16707
 2764  015642  016707                          .WORD   16707
 2765  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                          DH%102)
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                          DH%103)
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                          DH%104)
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                          DH%105)
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                          DH%106)
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                          DH%107)
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   16707
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                          DH%110)
```

```
 2874  016160  016707                    ,WORD   16707
 2875  016162  016707                    ,WORD   16707
 2876  016164  016707                    ,WORD   16707
 2877  016166  016707                    ,WORD   16707
 2878  016170  016707                    ,WORD   16707
 2879  016172  016707                    ,WORD   16707
 2880  016174  016707                    ,WORD   16707
 2881  016176  016707                    ,WORD   16707
 2882  016200  016707                    ,WORD   16707
 2883  016202  016707                    ,WORD   16707
 2884  016204  016707                    ,WORD   16707
 2885  016206  016707                    ,WORD   16707
 2886  016210  016707                    ,WORD   16707
 2887  016212  016707                    ,WORD   16707
 2888  016214  016707                    ,WORD   16707
 2889  016216  016707                    ,WORD   16707
 2890  016220                  DH$111:
 2891  016220  016707                    ,WORD   16707
 2892  016222  016707                    ,WORD   16707
 2893  016224  016707                    ,WORD   16707
 2894  016226  016707                    ,WORD   16707
 2895  016230  016707                    ,WORD   16707
 2896  016232  016707                    ,WORD   16707
 2897  016234  016707                    ,WORD   16707
 2898  016236  016707                    ,WORD   16707
 2899  016240  016707                    ,WORD   16707
 2900  016242  016707                    ,WORD   16707
 2901  016244  016707                    ,WORD   16707
 2902  016246  016707                    ,WORD   16707
 2903  016250  016707                    ,WORD   16707
 2904  016252  016707                    ,WORD   16707
 2905  016254  016707                    ,WORD   16707
 2906  016256  016707                    ,WORD   16707
 2907  016260                  DH$112:
 2908  016260  016707                    ,WORD   16707
 2909  016262  016707                    ,WORD   16707
 2910  016264  016707                    ,WORD   16707
 2911  016266  016707                    ,WORD   16707
 2912  016270  016707                    ,WORD   16707
 2913  016272  016707                    ,WORD   16707
 2914  016274  016707                    ,WORD   16707
 2915  016276  016707                    ,WORD   16707
 2916  016300  016707                    ,WORD   16707
 2917  016302  016707                    ,WORD   16707
 2918  016304  016707                    ,WORD   16707
 2919  016306  016707                    ,WORD   16707
 2920  016310  016707                    ,WORD   16707
 2921  016312  016707                    ,WORD   16707
 2922  016314  016707                    ,WORD   16707
 2923  016316  016707                    ,WORD   16707
 2924  016320                  DH$113:
 2925  016320  016707                    ,WORD   16707
 2926  016322  016707                    ,WORD   16707
 2927  016324  016707                    ,WORD   16707
```



```
 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                  DH$114:
 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                  DH$115:
 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                  DH$116:
 2976  016462  016707                    ,WORD   16707
 2977  016462  016707                    ,WORD   16707
 2978  016464  016707                    ,WORD   16707
 2979  016466  016707                    ,WORD   16707
 2980  016472  016707                    ,WORD   16707
 2981  016472  016707                    ,WORD   16707
```

```
 2982  016474  016707                          ;WORD   16707
 2983  016476  016707                          ;WORD   16707
 2984  016500  016707                          ;WORD   16707
 2985  016502  016707                          ;WORD   16707
 2986  016504  016707                          ;WORD   16707
 2987  016506  016707                          ;WORD   16707
 2988  016510  016707                          ;WORD   16707
 2989  016512  016707                          ;WORD   16707
 2990  016514  016707                          ;WORD   16707
 2991  016516  016707                          ;WORD   16707
 2992  016520                          DH%117:
 2993  016520  016707                          ;WORD   16707
 2994  016522  016707                          ;WORD   16707
 2995  016524  016707                          ;WORD   16707
 2996  016526  016707                          ;WORD   16707
 2997  016530  016707                          ;WORD   16707
 2998  016532  016707                          ;WORD   16707
 2999  016534  016707                          ;WORD   16707
 3000  016536  016707                          ;WORD   16707
 3001  016540  016707                          ;WORD   16707
 3002  016542  016707                          ;WORD   16707
 3003  016544  016707                          ;WORD   16707
 3004  016546  016707                          ;WORD   16707
 3005  016550  016707                          ;WORD   16707
 3006  016552  016707                          ;WORD   16707
 3007  016554  016707                          ;WORD   16707
 3008  016556  016707                          ;WORD   16707
```



```
 3009                                    ;SBTTL  EXISTING LINE TABLE
 3010
 3011
 3012
 3013                            ;**********
 3014                            ;
 3015                            ;EXISTING LINE TABLE
 3016                            ;
 3017                            ;THIS 16 WORD TABLE, ONE ENTRY FOR EACH OF THE POSSIBLE 16 DH11'S
 3018                            ;OR DJ11'S INDICATES WHICH OF THE LINES HAVE A TERMINAL CONNECTED
 3019                            ;THIS TABLE SHOULD BE INITIALIZED BEFORE RUNNING THE DIAGNOSTIC.  BIT 0
 3020                            ;IS LINE #0 WHILE BIT 15 IS LINE #15.  A 1 INDICATES THAT A TERMINAL IS
 3021                            ;NOT CONNECTED WHILE A 0 INDICATES THAT THE TERMINAL DOES EXIST ON THE
 3022                            ;LINE.
 3023                            ;
 3024                            ;EX.  IF THERE ARE TERMINALS ON LINE #0,#5,#10 AND#13  ONLY, ON THE
 3025                            ;FIRST DH11 AND NO OTHER DH11 EXIST, SET THE FIRST ENTRY IN THIS
 3026                            ;TABLE = 155736 AND ALL OTHER WORDS = 177777.  THE DIAGNOSTIC IS
 3027                            ;INITIALIZED SO THAT NO TERMINALS EXIST.
 3028                            ;
 3029                            ;**********
 3030
 3031
 3032
 3033  016560  177777          ELVAB:  ;WORD   177777          ;FIRST DH11
 3034  016562  177777                  ;WORD   177777
 3035  016564  177777                  ;WORD   177777
 3036  016566  177777                  ;WORD   177777
 3037  016570  177777                  ;WORD   177777
 3038  016572  177777                  ;WORD   177777
 3039  016574  177777                  ;WORD   177777
 3040  016576  177777                  ;WORD   177777
 3041  016600  177777                  ;WORD   177777
 3042  016602  177777                  ;WORD   177777
 3043  016604  177777                  ;WORD   177777
 3044  016606  177777                  ;WORD   177777
 3045  016610  177777                  ;WORD   177777
 3046  016612  177777                  ;WORD   177777
 3047  016614  177777                  ;WORD   177777
 3048  016616  177777                  ;WORD   177777
```

```
                                                .SBTTL  DIAGNOSTIC MESSAGES

016620  007600  040515  047111  STARTM: .ASCII  <ACRLF><17>/MAINDEC-11-DZLAD-C/<ACRLF>
016626  042504  026503  030461
016634  042055  046132  042101
016642  041455     200
016645     114  031501  020066          .ASCII  /LA36 TERMINAL DIAGNOSTIC/<ACRLF>
016652  042524  046522  047111
016660  046101  042040  040511
016666  047107  051517  044524
016674  100103
016676  044104  030461  023040          .ASCII  /DH11 & DJ11 INTERFACES/<ACRLF><12>
016704  042040  030512  020061
016712  047111  042524  043122
016720  041501  051505  005200
016726     000
016727     200  042412  042116  ENDPAS: .ASCII  <ACRLF><12>/END OF PASS  /
016734  047440  020106  046520
016742  051523  020040
016746  030060  030060  005200  PASMES: .ASCIZ  /0000/<ACRLF><12>
016754     000
016755     060  020060  044104  DHI1S:  .ASCIZ  /00 DHI1'S UNDER TEST/<ACRLF><12>
016762  030461  051447  052440
016770  042116  051105  052040
016776  051503  100124  000012
017004  030060  042040  030512  DJ11S:  .ASCIZ  /00 DJI1'S UNDER TEST/<ACRLF><12>
017012  023461  020123  047125
017020  042504  020122  042524
017026  052123  005200     000
017033     200  005017  042524  HDRMSG: .ASCIZ  <ACRLF><17><12>/TEST #/
017040  052123  021440     000
017045     060  030060  041440  HDR0:   .ASCIZ  /000 COLUMNS/<ACRLF><12>
017052  046117  046525  051516
017060  005200     000
017063     124  050131  020105  E025MA: .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  E025MB: .ASCIZ  <ACRLF>/NOT ENOUGH COLUMNS/<ACRLF>
017170  047105  052517  044107
017176  041440  046117  046525
017204  051516  000200
017210  042600  044103  020117  ECOEND: .ASCIZ  <ACRLF>/ECHO TEST TERMINATED/<ACRLF>
017216  042524  052123  052040
017224  051105  044515  040516
```



```
017232  042524  100104     000
017237     040     040          E023M:  .ASCII  /  /
017241     040  020040     040  LINES:  .ASCII  /   /          ;MESG FOR TEST E023

017245     040  020040  020040  LINESA: .ASCIZ  /       /<ACRLF>
017252  020040  100040     000
017257     200  005017  042523  MESG3:  .ASCIZ  <ACRLF><17><12>/SELECT TEST #  /
017264  042514  052103  052040
017272  051505  020124  020043
017300  000040

017302  053105  047105          EVEN:   .ASCII  /EVEN/
017306  042117  020104          ODD:    .ASCII  /ODD /

                                        .EVEN

                                        .END

000001
```

```
ACRLF = 000200          ACTIV   001222          ADTENP  004274          BAR     001190
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          CNTLBW  001184
CNVCTR  004266          CR    = 104014          CRLF  = 104006          CSR     001236
CURTST  001120          DELAY = 104003          DHADR   001134          DHCNT   001230
DH11S   016755          DH1100  013560          DH1101  013620          DH1102  013660
DH1103  013720          DH1104  013760          DH1105  014020          DH1106  014060
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     004036          ECHO  = 104021          ECHODJ  003442
ECOEND  017210          ELTAB   016560          EMTINT  003256          EMTTAB  003332
ENDIT   005262          ENDITD  005254          ENDITR  005246          ENDPAB  014727
END3    001400          END4    001446          EO20    010756          EO21    011082
EO21A   011030          EO21B   011064          EO22    011074          EO22A   011102
EO22B   011144          EO23    011360          EO23M   017237          EO24    011702
EO24R   011710          EO24R   011770          EO25    014466          EO25MA  017063
EO25MB  017163          EVEN    017302          FORWD = 104016          HDRMSG  017033
HDR0    017045          HERE    010600          INRDY = 104022          IOSW    001204
LF    = 104010          LFCNT   001132          LINENO  001156          LINE2   006774
LINE3   007516          LINE5   017241          LINEBA  017245          LOGICA  010570
LPR     001142          MACHER  000004          MASK    001160          MESG3   017257
MG24    011672          MG25    011676          MONIC   011154          MOVNUM  011680
NG      002544          NRGRA   001140          NXTST   001110          ODD     017306
OPEN  = 000000          OUTPUT  012002          PARITY  001126          PASCNT  010754
PASMES  016746          PC      =%000007        PCHAR   001130          PFAIL   004180
POPSP2= 022626          POSI    001122          PRGTAB  003156          PRINTC= 104011
PRINTJ  003324          PRTHDR= 104012          PT0     004410          PT1     004464
PT10    010334          PT11    010472          PT12    010524          PT12A   010532
PT17    010614          PT17B   010604          PT17D   010626          PT2     006606
PT3     007236          PT4     007356          PT5     007534          PTBAL   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  003604          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
TENPWR  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    001052          TTY1A   002054
TTY1R   002104          TTY1G   002410          TTY1H   002450          TTY1L   002516
TYP     003776          TYPE  = 104000          TYPEM = 104002          TYPM    004026
T30SC   012750          WIDTH   001112          $BTASC  004202          $CLEAN  001732
$CR     004370          $CRLF   004356          $ECHO   003400          $FORWD  002562
```



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

ERRORS DETECTED: 0

*;DZLADC=DZLADC/SOL
RUN-TIME: 9 18 0 SECONDS
CORE USED: 5K

digital

ENGINEERING CHANGE ORDER

ORIGINATOR R. Quenneville
TEL EXT 3328 DATE 2/16/76
LOCATION ML21-4/E10
COST CENTER NO. 301

ECO NO. MD-11.DZLAD-C1/03
SHEET 1 OF 2
DATE RECEIVED 19-FEB-76
ISSUE DATE
FINAL RELEASE

PROBLEM

Option Test #34 (Horizontal Tab) will fail intermittently giving misleading results on the 5th pattern in test.

UNIT TO BE CHANGED

MAINDEC-11
DZLAD-C

PRODUCT FAMILIES AFFECTED

LA-36's with Horizontal Tab Option Installed

CORRECTION

Include 4 fill characters after each carriage return in Test # 34.

TYPE OF ECO

- ☐ HARDWARE
- ■ SOFTWARE
- ☐ PURCHASE SPEC.

BREAK-IN/EFFECTIVITY

Temporary Patch, for use if needed. Conditional Patch
A Permanent solution will be included in the next revision of DZLAD.

MAR-76

FIELD SERVICE AFFECTED

■ YES ☐ NO
[F] D, P, R DISTR.
[ ] L.O.U. CODE

WHERE USED

QUICK-CHECK

TEST

ITEM NO.	DOCUMENT/PART NO.	OLD REV	NEW REV	DESCRIPTION OF CHANGE/DISPOSITION OF MATERIAL
1	DZLAD-C-PB	C	C1	Use Patch given on sheet 2 of this ECO (if needed)

APPROVAL SIGNATURE (TYPE NAME and SIGN)

PROJECT ENGR. R. Quenneville R. Quenneville
ENG. MGR.
TEL. EXT. 3328 COST CENTER NO. 301
DISC. PROJ. NO. V98-06691 DATE 2/16/76

COORD. NO. MC.0237 REF. NO.

REVIEW SIGNATURES (SEE INSTRUCTIONS FOR APPLIC.)

FIELD SERVICE
DIAGNOSTIC ENGR. R. Quenneville R. Quenneville
H Kellicutt DM JH

digital
ENGINEERING
CHANGE ORDER

CONTINUATION
SHEET

ECO NO. MD 11-DZLAD-C1/2

SHEET 2 OF 2

ITEM NO.	DOCUMENT/PART NO.	OLD REV	NEW REV	DISP CODE	DESCRIPTION OF CHANGE

Patch for DZLAD-C Test #34

CHANGE LOC.	FROM	TO	DESCRIPTION
000034	X	017400	Enable Trap
000036	X	000340	vector.
014612	104014	104777	Trap to Patch.
014674	104014	104777	Trap to Patch.
014766	104014	104777	Trap to Patch
017400	X	104014	Carriage Return
017402	X	012705	Into R5
017404	X	000004	Place a 4.
017406	X	012700	Into R0
017410	X	000006	Place the ACK code.
017412	X	104011	Transmit code
017414	X	005305	a total of
017416	X	101373	4 times.
017420	X	000002	Return to Mainline.