LA00/LA34

LA00 DMT PROGRAM

CZLAIA0

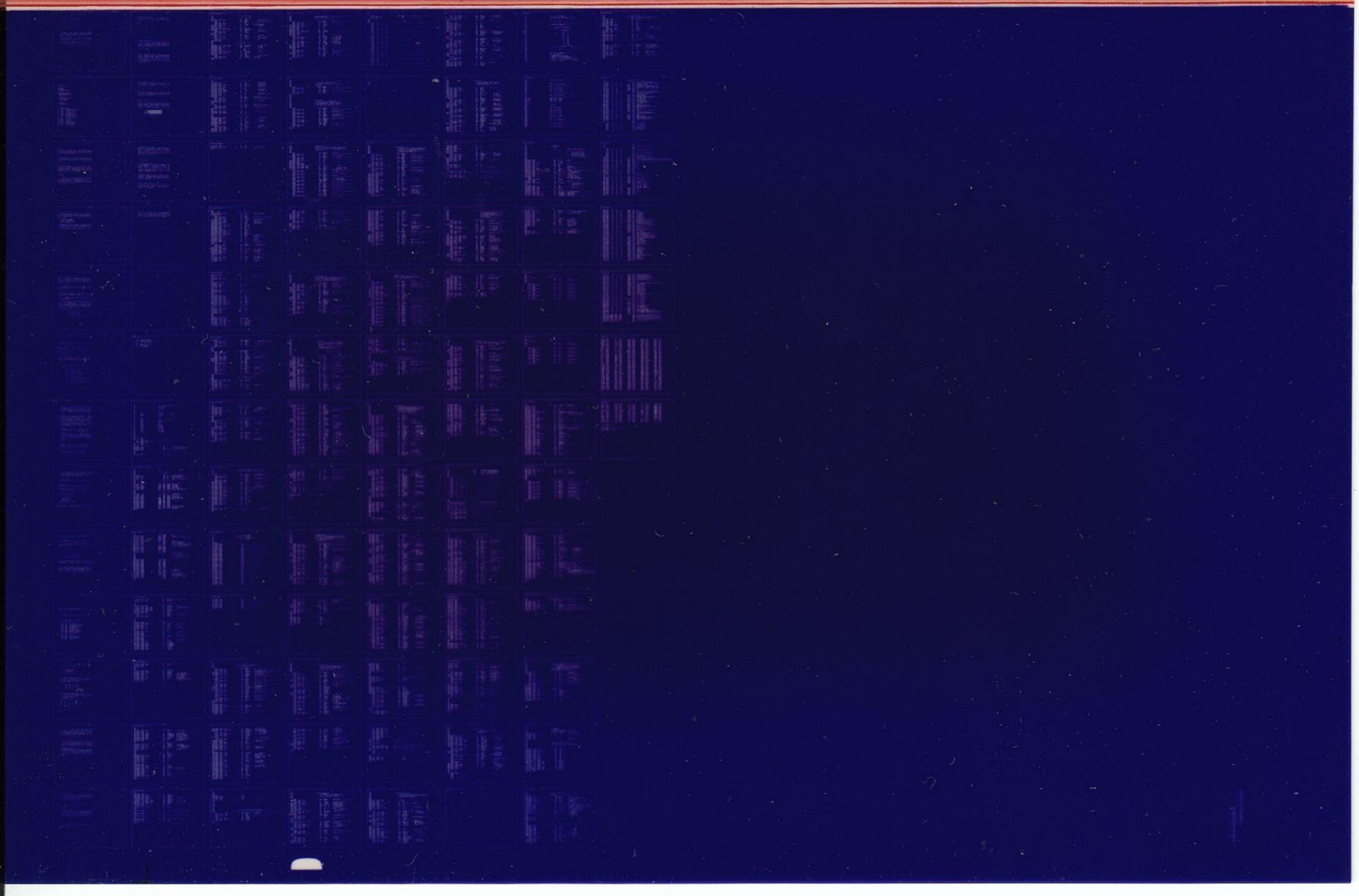
AH-E150A-MC

FICHE 1 OF 1

DEC 1978

digital

MADE IN USA



IDENTIFICATION

Product code: AC-E149A-MC

Product name: CZLAIA0 LA00 DMT PROG

Date created: APRIL 1978

Maintainer : Diagnostic Engineering

Author : Ralph A. Schauber

TABLE OF CONTENTS

1.0 ABSTRACT

This program is a functional test of the LA00 terminal. It can test up to 40 terminals at a time, interfaced through a DZ11-A/E asyncronous multiplexers. This program was designed to test all of the functional characteristics of the LA00 terminal in a DMT or PMT enviornment.

1.1 Functional Description

This program consists of a test selection and control section, a console terminal driver section, multi unit DZ11 driver section, and twenty two functional tests. The tests are of three types, printer function tests, manual intervention tests, and exercisors.

1.2 Intended Users

This program was designed to test every functional characteristic of the LA00 terminal, and as such will be used for design maturity testing. The operator will have the option of running the program in a non-intervention mode, thus allowing the program to be used in a PMT enviornment. The tests were not written to F.S. or FA&T requirements, and the use of this program in those areas is not recommended.

2.0 REQUIREMENTS

2.1 Equipment

This program will require a PDP-11 processor, with 16K of memory. For each eight terminals to be tested a DZ11-A,E is required along with one H317-E distribution pannel for each sixteen terminals under test. A hardware switch register is supported, but is not required. If program control is to be via console terminal then a terminal and interface at the standard address & vector are required.

2.2 Related programs.

This program will perform cursorary testing of the DZ11 interface, and should not be considered a valid test of anything other than the LA00 terminal. PDP-11 processor and memory diagnostic programs, along with DZ11 diagnostic programs should be run periodicly to insure correct operation of the system.

Other LA00 Diagnostic programs:
CZLAIA-0 this program
CZLAJA-0 LA00 FA&T Program
CZLA??-0 LA00 FS Diagnostic

2.3 Terminal Configuration

This program requires that all terminals to be tested be set up for 300 baud, 1 stop bit, Odd parity, and XON-XOFF enabled. Enter setup mode and type an 8 to get a printout of the current switch settings. If not correct change the switches then verify again using the 8 key again. These switches are located on the PC board directly under the keyboard assy.

3.0 LOADING PROCEDURE AND INITIALIZATION

Load the LA00 diagnostic program tape following normal procedures. If a hardware switch register does not exist, the program will use the contents of location 000176 as the value of the switches. Therefore, be sure to load location 000176 with the switch value before starting the program when not using switches.

3.1 Startirg addresses

There are two starting addresses for this program. Starting at location 000200 will put the testing under switch register control. Starting at location 000204 will put the program under console control.

3.2 Modifications to program.

There are a number of common data storage locations which may be modified by the operator to compensate for non standard configurations, and different CPU types.

For DZ11's not at the standard addresses or vectors the locations named dzaddr and dzvect can be changed accordingly prior to starting the program.

Location loopc contains a time constant and is initially set for a PDP-11/20 processor. This time constant is not critical, but large variations from those listed in the table will result in inefficient operation. it is better to have a longer time constant than one too short because the routines that use the timeout feature will abort the timeout when the required input is recieved. Those tests that require manual intervention will not function correctly if the timeout is too fast for operator response times.

This table is duplicated in the listing.

```
loopc:  000314  ;time constant for11/20
                   ;set to 202 for 11/03
                   ;set to 251 for 11/10
                   ;set to 554 for 11/40
                   ;set to 755 for 11/45, 11/60
                   ;set to 1237 for 11/45, 11/70
                   ;set to 2127 for 11/45 bip, 11/55
```

3.3 Execution time

At 300 baud and excluding manual intervention tests this program should take approximately 13 min.

4.0 Control and test selection

There are two means of controlling the execution of this program: via the console switch register, or via the console terminal.

If the program is started at location 200 and no hardware switch register exists the program will use the contents of location 176 as the switches

4.1 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 on error 0(down) = Continue after error report
14	1(up) = Loop on test if error detected 0(down) = Continue testing
13	1(up) = Inhibit error reports 0(down) = Print error reports
12	1(up) = Run individual test 0(down) = Run tests in sequence
10	1(up) = Get test no. from sws 4 : 0 0(down) = Use default test #0
9	1(up) = pmt mode minimum manual intervention 0(down) = dmt mode intervention required
8	1(up) = Run 1 pass of test sequence then halt 0(down) = Keep running test or sequence
4-	Test number selection

4.1.1 Switch 15
Placing switch 15 down will cause the program to continue on errors during any of the i/o tests. With switch 15 up, the program will halt (at errhlt) on any error during the i/o tests with the location of the error in R0. pressing continue will cause the program to continue if switch 12 is down (loop on error). With switch 12 up, pressing continue will cause the program to loop on the failing test.

4.1.2 Switch 14
Placing switch 14 up will cause the program to "loop on test" if an error is detected in that test. Error reports will be typed unless inhibited (switch 13 up). Looping will occur automaticly, without operator intervention, and will and will continue until the error ceases to happe, or the switch is placed down or =0. 4.1.2 Switch 14
Placing switch 14 up will cause the program to "loop on test" if an error is detected in that test. Error reports will be typed unless inhibited (switch 13 up). Looping will occur automaticly, without operator intervention, and will continue until the error ceases to happen, or the switch is placed down or -0.

4.1.3 Switch 13
Placing switch 13 up will inhibit the printing of all error reports. Can be used in conjunction with switch 14 to loop in errors for troubleshooting.

4.1.4 Switch 12
Placing switch 12 up will cause the program to loop in the current, or selected test. If switch 8 is up the test will halt at the end of the test. Pressing continue will cause the test to be started over again. Placing switch 12 down will cause the next sequential test to be executed , unless the test is an intervention test and PMT mode is selected.

4.1.5 Switch 11
Not used.

4.1.6 Switch 10
Placing switch 10 up will cause the program to use the contents of switches 4 thru 0 as the test number. If switch 12 is up this is the test that will be run, if switch 12 is down the sequence of tests to be run will start with this test.

4.1.7 Switch 9
Putting switch 9 up at the start of testing will inhibit manual intervention tests , and use a fixed set of parameters as listed in the description of each test.

4.1.8 Switch 8
With switch 8 down the program will loop on the selected test or test sequence as selected by switch 12. Placing switch 8 up will cause the program to halt at the completion of the current test, or test sequence. Pressing continue will result in the program restarting the test or sequence depending on switch 12.

4.1.9 Switches 4 to 0
Switches 4 to 0 are used to select specific tests when under switch register control. Test numbers are always in octal, from 00 to 22.

4.2 Keyboard control
Switches on the console switch register will have no effect when under terminal control except for switch 13.

The program will print the following : ENTER MODE D OR P : respond by typing either a 'D' for DMT mode, or a 'P' for PMT mode (no manual intervention).

The program will print READY on the console, then wait for commands from the keyboard.

The following commands will be recognized :

R to run a selected test.
S to sequence thru tests.
L to loop on error.
H to halt on error.
C to clear the H & L commands
W to set the "width" control

The period (.) is a terminator used in conjunction with the R and S commands to specify a single pass. That is to stop after running a test, or to stop after running a sequence of tests.

To abort operations and return to the WAIT state at any time type a CTL-C. The program will respond with READY and wait for command input.

Enter one command per line, followed by a return. If conflicting commands are entered the last entry will be used.

To exit "command mode" type an escape. The program will type READY and begin execution of the commands. Commands can be entered at any time, but new tests will not start until the escape character is recieved.

Examples of commands :

R12	run test 12
R23.	run test 23 then halt
S.	sequence all tests then halt
S27	sequence all tests starting with test 27
W100	set width to 100 (octal) columns (204=132 colm, 120=80 colm)

If a test is selected that is an operator intervention test, and PMT mode is selected the following will be typed: RUN INTERVENTION TEST ? answer Y or N. If Y is typed the test will be run. If N is typed a new test number will be requested.

The R,S,H,L,W, and C may be either upper or lower case, but the test number must always be a 2 digit octal number. The command, test number, and terminator are echoed by the program, thus each character will be printed twice if the terminal is in half duplex. If an error is detected in the test selection (illegal test number or command character) a question mark is printed and the message will be repeated.

READY

5.0 test groups

5.1 Terminal tests

5.2 Intervention tests

The tests 17 thru 24 require manual intervention. these tests are not run in PMT mode (see description of sw 9 4.1.7, and console control startup 4.2).

5.3 Exercisors

Tests 15 and 16 are designed as exercisors, and can be run for extended periods to "burn in" the units under test.

5.4 Test assignments

Tests listed as DMT will not be executed in PMT mode. See description of switch 9 4.1.7 .

Test00	LA00	Data paths test
Test01	LA00	All printable characters test
Test02	LA00	Non printable characters test
Test03	LA00	Printhead dot matrix test
Test04	LA00	Horizontal pitch test
Test05	LA00	Space-backspace test
Test06	LA00	Set margins test
Test07	LA00	Horizontal tabs test
Test10	LA00	Multiple line feed test
Test11	LA00	Horizontal motion test
Test12	LA00	Buffer overrun test
Test13	LA00	Vertical pitch test
Test14	LA00	Bell test
Test15	LA00	Life test
Test16	LA00	Printer dynamic exercisor
Test17	DMT	Interface speeds test
Test20	DMT	Keyboard echo test
Test21	DMT	Character code echo test.
Test22	DMT	Pitch setup test

6.0. Test description

6.1 Data paths test00

This test will print four lines of alternating *U U pattern. It is a confidence test of the internal data bus, and reciever logic.

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*...
```

estimated time at 300 baud 18 seconds.

6.2 All printable characters test01

This test will print each of the printable characters in groups of four, seperated by two spaces. The groups will be printed in order, and the number of groups per line will be dependent on the "width" set at the start of the diagnostic. (default 132 colm)

Example :

```
AAAA   BBBB   CCCC   DDDD
EEEE   FFFF   GGGG   HHHH
3333   4444   5555   6666
%%%%   @@@@   ++++   ????
```

estimated time at 300 baud 30 sec

6.3 Non printable characters test02

This test checks all non-printable characters. In this test all non-printable character codes are transmitted, followed by the words: 'NON-PRINTING CHARACTER TEST.THE NEXT LINE SHOULD BE BLANK.
If any characters appear on the next line an error exists.

The following codes are transmitted :

000	NUL	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	021	DC1(XON)		

estimated time at 300 baud 5 seconds

6.4 Dot matrix test03

This test will print the five characters ZH*#$, then print four lines of data that will create black boxes by overprinting the same five characters as above. Ten boxes will appear on each of the four lines at different spacings. This test will amplify any weak or intermittant head wire problems. The boxes should appear an even dark black, with no dots missing or lite streaks.

estimated time at 300 baud 10 seconds

6.5 H izontal pitch test04
This test will print five groups of lines at each of the horizontal pitch settings. Each group of lines will consist of first a line stating the current pitch settings, then a line of the characters A thru Z. This is done for horizontal pitch settings of 10 CPI, 12 CPI, 13.2 CPI, and 16.5 CPI. The setup for this test is down line loaded.

estimated time at 300 baud 30 seconds

6.6 Space-Backspace test05
A line of alternating slashes and spaces is printed across the page. The program will then backspace through the line and overprint the slashes with backslashes. Two lines are printed for each pass of the test. The pattern produced is a line of alternating X's and spaces. The two slashes should cross exactly in the middle creating the X character.

example : X X X X X X X X X X X X X X X X X X X X X X X X

estimated time at 300 baud 45 seconds

6.7 Set margins test06
This test will set 4 pairs of left and right margins, then it will print a line of '='s that should be within those margins. Also a message will be sent specifying an error if it's not at the left margin. A reference line will be printed showing the margin limits being set up. All horizontal pitch settings will be tested.

example :

```
......V.......................V.........
      ERROR IF NOT AT LH MARGIN
```

estimated time at 300 baud 40 seconds

6.8 horizontal tabs test07
this test will print a reference line composed of a number of periods followed by a 'V'. This pattern is repeated across the page. The location of each V will mark the location of a tab stop set by the program. Three lines will then be printed under this reference line, composed of a horizontal tab followed by an I, repeated across the page. The I's should line up directly under the reference line V's.

Example :

```
......V......V......V......V...
      I      I      I      I
      I      I      I      I
      I      I      I      I
```

This will be repeated for a variety of different tab settings. The number of tabs per line will be controled by the ''width'' specified at the start of the diagnostic.

estimated time at 300 baud, 132 col - 2 min

6.9 Multiple line feed test10
This test will print a reference line of dashes then skip N lines and print the no. of lines skipped along with some dashes for visual reference. Each skip count is done twice for N = 1 to 7. Vertical pitch will be 6 lines per inch.

EXAMPLE :

```
------------------------
------01
------01

------02

------02


------03


------03
```

estimated time at 300 baud 15 seconds

6.10 Horizontal motion test11
This test will exercise the head positioning logic by printing a line of H's at random column locations within the line. The head will be positioned using spaces, backspaces, and carriage returns followed by spaces. The number of columns printed is controled by the 'width' as set at the start of the program. All H's should be evenly spaced, with no overprints.

estimated time at
300 baud 4 min

6.11 Buffer overrun test12
This test will force the terminal to send an XOFF char (023) by issueing a series of time consumeing movement commands, followed by enough characters to fill the buffer past it's 118 character limit. When the terminal has emptied the buffer to the 10 character level it should transmit an XON character (021) allowing the host to finish sending data. Any terminal that fails to send the XON will be considered to be "dead", and will be deselected or set inactive.

estimated time at 300 baud 10 seconds.

6.12 Vertical pitch test13
This test will print six lines at each of the vertical pitch settings: 2,3,4,6,8 and 12 lines per inch. The line printed will be a message that lists the current CPI and LPI settings. The setup for this test is down line loaded.

estimated time at 300 baud 40 seconds

6.13 Bell test14
This test checks the printer bell 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.

estimated time 1 second

6.14 LA00 life test15
Ordinarily this test simply prints a line of 'A's.

When this test is looped on, it prints two lines of each printable character. When all printable characters have been done, they will simply be repeated. The current pass number is printed on each line, with a 1 column offset on each new li e.The number of characters per line will be determined by the 'width" as selected at program startup.

example :

```
 01 AAAAAAAAAAAAAAAAAAAAAAAAAAAA..
A 01 AAAAAAAAAAAAAAAAAAAAAAAAAAA..
BB 01 BBBBBBBBBBBBBBBBBBBBBBBBBB..
BBB 01 BBBBBBBBBBBBBBBBBBBBBBBBB..
CCCC 01 CCCCCCCCCCCCCCCCCCCCCCCC..
CCCCC 01 CCCCCCCCCCCCCCCCCCCCCCC..
```

estimated time 1 line 300 baud 5 seconds

6.15 LA00 dynamic exercisor test16
This test will print 35 lines of mixed format data. A pattern will be created which is comprised of the upper and lower case character set plus eight of the special symbols. This pattern will be in the form of a 10'' by 6'' matrix, where the upper left corner will have the greatest character density and the lower right corner will have the lowest density. All possable combinations of horizontal and vertical pitch will be used.

estimated time at 300 baud 2.5 min.

intervention tests

no time estimates given

6.16 interface baud rates test17
This test will request that the operator change the speed on all terminals to 110 baud. The program will then transmit a message to all terminals at this baud rate, identifing the current speed, then by use of the escape sequence ESC [0c the terminal ID message will be sent from each terminal to the PDP-11 to verify correct transmission and reception by the terminal. This same procedure is repeated for 300 baud. because of intervention no time estimate is given

6.17 Keyboard echo test20
This test will require the operator to type all the printing keys on the keyboard. If any keys are not seen by the host they will be requested again , and a third time if necessary. Instructions will then be typed to press the tab, return, and other non printing keys. five seconds is allowed per key delay.

6.18 Character code echo test21
This test will print the octal code of any key pressed, along with the ascii character. Where the character is a non printable code the mnemonic of that code will be printed. The delete char will be echoed as a mnemonic, then the test will be done.

6.19 Pitch setup test22
this test will require the operator to change the terminal setup to that requested. After each setup change the PDP-11 will send a line of data that should conform to the params setup. The data sent after vertical pitch changes will be a number of short lines that should span 1 inch verticaly. That is eignt lines after the change to 8 LPI etc.

SEQ 0018

CZLAIAO LA00 DMT PROG MACRO M1110 20-APR-78 04:21
TABLE OF CONTENTS SEQ 0019

```
                                        .TITLE  CZLAIA0 LA00 DMT PROG
                                        .SBTTL  DMT/PMT PROGRAM FOR LA00 TERMINAL
000000                                  .ENABL  ABS
                                        .ENABLE AMA
                                        .LIST MC,ME

                                        ;SOME DEFINITIONS

                000060                  DLRVEC=60
                000064                  DLTVEC=64
                000000                  PRI0=000000
                000200                  PRI4=200
                000340                  PRI7=340

                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

                000005                  DZCON=5.        ;MAX NO. OF DZ11'S  THIS COMPILE

000000                                  .ASECT

                000000                  .=0
000000  000002  000000                          .WORD   2,0             ;START OF TRAP CATCHER AREA
                000004                  . 4
000004  000006  000000  000012         TRAP4:   .WORD   6,0,12,0,16,0,22,0
000012  000000  000016  000000
000020  000022  000000
                000024                  . 24
000024  001220  000000                 PFAIL:   .WORD   START,PRI0
                000041                  .-41
000041     000                         ACTDVC:  .BYTE   0       ;ACT11 LOAD MEDIUM
000042  000000                                  .WORD   0       ;ACT11 MODE  0 IS MANUAL MODE
000044  001000                                  .WORD   APTHDR  ;APT11 HEADER BLOCK ADDRESS
000046  003634                                  .WORD   EOP     ;ACT11 END OF PASS HOOK ROUTINE
000050  000000                                  .WORD   0
000052  020000                                  .WORD   20000   ;ACT11 MANUAL MODE ONLY


                000200                  . 200
000200  000137  001220                          JMP     START
000204  000137  001242                          JMP     KSTART
```

```
 12500           001000                          . 1000
 12600                                           .EVEN
 12700                                           ;TOP OF STACK AREA
 12800
 12900                                           ; APT PARAMETER BLOCK
 13000
 13100 001000  000000                            APTHDR: .WORD   0       ;HIGH ORDER ADDRESS BITS
 13200 001002  001014                                    .WORD   $MAIL   ;ADDRESS OF APT MAILBOX
 13300 001004  000360                                    .WORD   240.    ;TIME FOR LONGEST TEST 4 MIN.
 13400 001006  001440                                    .WORD   800.    ;TIME FOR QUICK PASS
 13500 001010  000012                                    .WORD   10.     ;TIME FOR EACH ADDITIONAL DVC
 13600 001012  000030                                    .WORD   $ETEND-$MAIL/2          ;LENGTH OF MAILBOX + ETABLE
 13700
 13800                                           ;APT MAILBOX AREA
 13900
 14000 001014  000000                            $MAIL:  .WORD   000000  ;MESSAGE TYPE CODE
 14100 001016  000000                            $FATAL: .WORD   000000  ;FATAL ERROR NO.
 14200 001020  000000                            $TSTNO: .WORD   000000  ;TEST NUMBER
 14300 001022  000000                            $PASNO: .WORD   000000  ;PASS NUMBER
 14400 001024  000000                            $DEVCT: .WORD   000000  ;DEVICE COUNT
 14500 001026  000000                            $UNIT:  .WORD   000000  ;UNIT NO. UNDER TEST
 14600 001030  000000                            $MSGAD: .WORD   000000  ;MESSAGE ADDRESS (WORD BOUNDRY)
 14700 001032  000000                            $MSGL:  .WORD   000000  ;MESSAGE LENGTH (IN WORDS)
 14800
 14900                                           ;APT ENVIORNMENT TABLE
 15000
 15100 001034      000                           $ETABL: .BYTE   0       ;0= STAND ALONE, 1=AUTOMATIC MODE
 15200 001035      000                                   .BYTE   0       ;CONTROL BITS
 15300 001036  000000                            $SWREG: .WORD   000000  ;APT SWITCH REG:ISTER
 15400 001040  000000                                    .WORD   000000  ;USER SWITCHES
 15500 001042  000000                            $CPU:   .WORD   000000  ;CPU TYPE AND OPTIONS
 15600 001044  000000                            $MEMAD: .WORD   000000  ;MEM TYPE & HIGH ORDER BITS
 15700 001046  000000                            $MEMAR: .WORD   000000  ;MEMORY ADDRESS- HIGH
 15800 001050  000000                            $MEMA2: .WORD   000000
 15900 001052  000000                            $MEMR2: .WORD   000000
 16000 001054  000000                            $MEMA3: .WORD   000000
 16100 001056  000000                            $MEMR3: .WORD   000000
 16200 001060  000000                            $MEMA4: .WORD   000000
 16300 001062  000000                            $MEMR4: .WORD   000000
 16400 001064  000000                            $VECT1: .WORD   000000  ;VECTOR #1, AND PRIORITY
 16500 001066  000000                            $VECT2: .WORD   000000  ;VECTOR #2, AND PRIORITY
 16600 001070  000000                            $BASE:  .WORD   000000  ;BASE ADDRESS OF DEVICES
 16700 001072  000000                            $DEVM:  .WORD   000000  ;DEVICE MAP
 16800 001074                                    $ETEND:                 ;END: OF ETABLE
 16900
```

```
17100                                   .SBTTL  COMMON DATA STORAGE
17200 001074  160000                    DZADDR: 160000          ;ADDRESS OF 1ST DZ11
17300 001076  000300                    DZVECT: 000300          ;ADDRESS OF 1ST DZ11 VECTOR
17400 001100  000000                    DXTMP:  000000          ;TEMP STORAGE FOR DZ XMIT INTERRUPT ROUTINE
17500 001102  000000                    MSGTYP: 000000
17600 001104  000000                    MSGADR: 000000
17700 001106  000000                    SENDTM: 000000
17800 001110  000000                    ERROR:  000000          ;ERROR SWITCH
17900 001112  000000                    SEQ:    000000          ;HOLDS TEST TABLE POINTER
18000 001114  000000                    TEST:   000000          ;POINTER TO CURRENT TEST
18100 001116  000000                    SO:     000000          ;THIS IS THE SIMULATED SWITCH REGISTER
18200 001120  000001                    SRCONT: 000001          ;THIS IS THE SWITCH REGISTER CONTROL SWITCH
18300 001122  177570                    SWR:    177570          ;POINTER TO SWITCH REG, OR SOFT SR
18400 001124  000000                    PASSNO: 000000          ;THIS IS THE PROGRAM PASS NUMBER
18500 001126  000000                    ANTMP0: 000000
18600 001130  000000                    ANTMP1: 000000
18700 001132  000000                    ANTMP2: 000000
18800 001134  000000                    TEMP:   000000
18900 001136  000000                    NOTYET: 000000
19000 001140  000000                    HOOK:   000000
19100 001142  000314                    LOOPC:  000314          ;TIME CONSTANT FOR  11/20
19200                                                           ;SET TO  202 FOR 11/03
19300                                                           ;SET TO  251 FOR 11/10
19400                                                           ;SET TO  554 FOR 11/40
19500                                                           ;SET TO  755 FOR 11/45, 11/60
19600                                                           ;SET TO 1237 FOR 11/45, 11/70
19700                                                           ;SET TO 2127 FOR 11/45 BIP, 11/55
19800 001144  000000                    LOOPI:  000000
19900 001146  000000                    LOOPO:  000000
20000 001150  000000                    TSTMP:  000000
20100 001152  000000                    NUMLIN: 000000
20200 001154  000000                    COM1:   000000
20300 001156  000000                    COM2:   000000
20400 001160  000000                    WORK:   000000
20500 001162  000000                    WORK1:  000000
20600 001164  000000                    WORK2:  000000
20700 001166  000000                    WORK3:  000000
20800 001170  000000                    CHARIN: 000000
20900 001172  000204                    WIDTH:  132.    ;SET TO 120 FOR 80 COLM
21000 001174  000000                    MODE:   000000          ;DZ TRANSMIT MODE
21100 001176  000000                    PMODE:  000000          ;PMT MODE FLAG
21200 001200  000000                    RCTMP:  000000
21300 001202  000000                    DZNUM:  000000          ;NO. OF DZ'S ACTUALLY ON SYSTEM
21400 001204  000000                    ONLINE: 000000          ;LINE NO. UNDER TEST
21500 001206  000000                    PNTR:   000000          ;CONSOLE BUFFER POINTER
21600 001210  000000                    TMPTST: 000000          ;CONSOLE ROUTINE TEMP FLAGS
21700 001212  000000                    TSTTYP: 000000          ;TEST DESCRIPTION DATA
21800 001214  000000                    GO:     000000
21900 001216  000000                    UUT:    000000          ;# OF UNITS UNDER TEST
22000
22100                                   .SBTTL  START POINT FOR PROGRAM
22200
```

```
                                        START:  MOV     #1000,SP        ;SETUP STACK POINTER
                                                BIS     #BIT15,SRCONT   ;SET SWITCH CONTROL
                                                JSR     PC,SWRTST
                                                JMP     INIT

                                        ;START HERE IF IN CONSOLE CONTROL

                                        KSTART: MOV     #1000,SP        ;INIT THE STACK
                                                JSR     PC,SWRTST
                                                MOV     #TTYIN,@#60     ;INIT CONSOLE VECTOR AREAS
                                                MOV     #PRI4,@#62      ;COMMANDS HAVE PRIORITY
                                                MOV     #66,64
                                                MOV     #PRI4,@#66
                                                MOV     #101,@#177560   ;TURN ON THE CONSOLE
                                                CLR     TMPTST
                                                CLR     SRCONT
                                                MOV     #TKBUF,PNTR     ;INPUT BUFFER POINTER
                                                SENDC   #MSG00          ;SEND TEST ID
                                                MOV     #MSG00,R5               ;GET MESSAGE ADDRESS
                                                JSR     PC,CSEND        ;SEND MESSAGE
                                                JMP     INIT



                                        ;HERE WE INIT THE DZ11 ROUTINES
                                        INIT:   NOP
                                                CLR     UUT
                                                MOV     #2$,TRAP4       ;SU TRAP CATCHER
                                                MOV     DZADDR,R0       ;GET FIRST DZ ADDRESS
                                                CLR     DZNUM
                                        1$:     TST     (R0)            ;DZ PRESENT ?
                                                INC     DZNUM           ;YES COUNT IT
                                                ADD     #10,R0          ;POINT TO NEXT ADDRESS
                                                BR      1$

                                        2$:     MOV     #6,TRAP4        ;FIX TRAP CATCHER
                                                TST     DZNUM           ;ANY DZ'S ?
                                                BNE     3$
                                                HALT                    ;NO- NOTHING TO TEST
                                                BR      .-2
                                        3$:     MOV     #1000,SP        ;CLEAR THE STACK POINTER
                                                MOV     DZNUM,R1        ;GET DZ COUNT
                                                ASL     R1
                                                ASL     R1
                                                ASL     R1              ;8 LINES PER DZ
                                                MOV     R1,NUMLIN       ;SAVE TOTAL NO OF LINES
                                                CLR     R0
                                                MOV     #DZCOMB,R2      ;START OF COMMAND BUFFERS
                                        4$:     MOV     R2,COMIN(R0)
                                                MOV     R2,COMOUT(R0)
                                                MOV     R2,COMEND(R0)
                                                ADD     #50,COMEND(R0)  ;END IS 20 WORDS AWAY
                                                CLR     COMCNT(R0)
                                                CLR     CURREP(R0)
                                                CLR     CURADD(R0)
                                                CLR     CURTER(R0)
                                                CLR     STOP(R0)
```

```
 5600 001520  012760  000145  020626                MOV     #145,DZLINE(R0) ;INIT TO  300 BAUD ODD PARITY
 5700 001526  062700  000002                        ADD     #2,R0
 5800 001532  062702  000050                        ADD     #50,R2          ;NEW BUF=OLD BUF + 20.
 5900 001536  005301                                DEC     R1
 6000 001540  001344                                BNE     4$
 6100
 6200
 6300                                       ;SETUP VECTORS FOR INTERRUPTS
 6400 001542  012702  032330                INIT1:  MOV     #DZRINT,R2
 6500 001546  012703  032246                        MOV     #DZTINT,R3
 6600 001552  013705  001076                        MOV     DZVECT,R5       ;FIRST VECTOR ADDRESS
 6700 001556  013704  001202                        MOV     DZNUM,R4        ;SETUP A COUNT FOR DZS
 6800 001562  010225                        1$:     MOV     R2,(R5)+        ;SETUP RECIEVE INT VECTOR
 6900 001564  012725  000240                        MOV     #240,(R5)+      ;AND ITS PRIORITY
 7000 001570  010325                                MOV     R3,(R5)+        ;SETUP TRANSMIT VECTOR
 7100 001572  012725  000240                        MOV     #240,(R5)+      ;AND ITS PRIORITY
 7200 001576  062703  000012                        ADD     #12,R3          ;SET POINTER TO NEXT INT SERVICE ROUTINE
 7300 001602  062702  000012                        ADD     #12,R2          ;SU NEXT RX INT SVC ROUTINE
 7400 001606  005304                                DEC     R4              ;NEXT LINE PLEASE
 7500 001610  001364                                BNE     1$              ;IF THERE IS ONE
 7600 001612  000240                                NOP
```

```
                                        ;INIT DZ11 RECEIVE
001614  013701  001152          INIT2:  MOV     NUMLIN,R1       ;GET # OF LINES
001620  012702  026446                  MOV     #KBBUF,R2       ;SETUP FIRST KEYBOARD BUFFERhASEA0ATDRESS
001624  005000                          CLR     R0
001626  005060  025626          1$:     CLR     KBCNT(R0)       ;ZERO CHAR COUNT
001632  010260  026066                  MOV     R2,KBBUFB(R0)   ;DEFINE BEGINING OF BUFFER
001636  010260  026206                  MOV     R2,KBBUFI(R0)   ;INIT PUT IN POINTER
001642  010260  026326                  MOV     R2,KBBUFO(R0)   ;AND TAKE OUT POINTER
001646  010260  025746                  MOV     R2,KBBUFE(R0)   ;DEFINE END OF BUFFER
001652  062760  000016  025746          ADD     #16,KBBUFE(R0)  ;AS 16 BYTES PAST BEGINING
001660  062700  000002                  ADD     #2,R0           ;NEXT LINE PLEASE
001664  062702  000020                  ADD     #20,R2          ;BUFFER AREAS ARE 20 BYTES LONG EACH
001670  005301                          DEC     R1              ;ANY  MORE TO SETUP?
001672  001355                          BNE     1$              ;YES. DO SO

                                        ;INIT DZ11 CSR REGISTER TABLE
001674  013700  001202          INIT3:  MOV     DZNUM,R0        ;COUNT OF DZS
001700  012701  031546                  MOV     #DZCSR,R1       ;SETUP ADDRESS OF TABLE
001704  013702  001074                  MOV     DZADDR,R2       ;SETUP ADDRESS OF 1ST CSR
001710  010221                  1$:     MOV     R2,(R1)+        ;PUT A CSR ADDRESS INTO THE TABLE
001712  012712  000020                  MOV     #20,(R2)                ;CLEAR THE DZ
001716  062702  000010                  ADD     #10,R2          ;CSRS ARE 4 WORDS APPART
001722  005300                          DEC     R0              ;ANY MORE TO DO?
001724  001371                          BNE     1$              ;YES. DO EM.


                                        ;INITIALIZE TABLE OF TCR BITS
001726  013701  001202          INIT4:  MOV     DZNUM,R1
001732  012702  025506                  MOV     #TCRBIT,R2
001736  012703  000001          1$:     MOV     #1,R3
001742  010322                  2$:     MOV     R3,(R2)+
001744  006303                          ASL     R3
001746  022703  000400                  CMP     #400,R3
001752  001373                          BNE     2$
001754  005301                          DEC     R1
001756  001367                          BNE     1$

001760  005000          INIT5:  CLR     R0
001762  005003                  CLR     R3
001764  012737  002044  000004        MOV     #5$,TRAP4
001772  016001  031546          1$:     MOV     DZCSR(R0),R1
001776  012702  012720                  MOV     #12720,R2       ;RX-ON,300,P-ODD,1-STOP,7-BIT
002002  010261  000002          2$:     MOV     R2,2(R1)        ;LOAD LPR REG
002006  005202                          INC     R2
002010  022702  012730                  CMP     #12730,R2       ;DONE ALL LINES ?
002014  001372                          BNE     2$
002016  062700  000002                  ADD     #2,R0
002022  005203                          INC     R3
002024  023703  001202                  CMP     DZNUM,R3
002030  001360                          BNE     1$
002032  012737  000006  000004        MOV     #6,TRAP4
002040  000137  002046                  JMP     INIT6

002044  000000          5$:     HALT            ;DZLPR TRAPPED (16XXX2)
```

```
 13600
 13700 002046  005000                        INIT6:  CLR     R0
 13800 002050  013701  001202                        MOV     DZNUM,R1
 13900 002054  016002  031546                1$:     MOV     DZCSR(R0),R2
 14000 002060  012737  002156  000004              MOV     #5$,TRAP4
 14100 002066  005762  000006                      TST     6(R2)           ;RING-CARRIER REG.
 14200 002072  012737  002164  000004              MOV     #6$,TRAP4
 14300 002100  012712  040140                      MOV     #40140,(R2)     ;SCAN-EN,RX INT EN,TX INT EN >>CSR
 14400 002104  012737  002172  000004              MOV     #7$,TRAP4
 14500 002112  112762  000377  000004              MOVB    #377,4(R2)      ;ENABLE ALL LINES TX >> TCR
 14600 002120  012737  002200  000004              MOV     #8$,TRAP4
 14700 002126  112762  000377  000005              MOVB    #377,5(R2)      ;SET DTR ALL LINES >> TCR+1
 14800 002134  062700  000002                      ADD     #2,R0
 14900 002140  005301                              DEC     R1
 15000 002142  001344                              BNE     1$
 15100 002144  012737  000006  000004              MOV     #6,TRAP4
 15200 002152  000137  002220                      JMP     ISEQ
 15300
 15400
 15500 002156  000000                        5$:     HALT            ;TRAPPED FROM 16XXX6 RING/CARRIER
 15600 002160  000137  002202                      JMP     10$
 15700
 15800 002164  000000                        6$:     HALT            ;TRAPPED FROM 16XXX0    CSR
 15900 002166  000137  002202                      JMP     10$
 16000
 16100 002172  000000                        7$:     HALT            ;TRAPPED FROM 16XXX4    TXMIT CTL
 16200 002174  000137  002202                      JMP     10$
 16300
 16400 002200  000000                        8$:     HALT            ;TRAPPED FROM 16XXX5    DTR
 16500 002202  005737  001120                10$:    TST     SRCONT
 16600 002206  001002                              BNE     11$
 16700 002210  000137  001242                      JMP     KSTART
 16800 002214  000137  001220                11$:    JMP     START
 16900
 17000
```

```
                                        ;TEST SEQUENCER SUBROUTINE
                                        ; TEST SEQUENCE INITIALIZATION
002220 012706 001000            ISEQ:   MOV     #1000,SP                ;SET STACK AT 1000
002224 012737 020326 001206             MOV     #1KBUF,PNTR             ;INIT TTY BUFFER POINTER
002232                                  SENDALL #MSG00                  ;SEND TEST I.D.
002232 012705 034442                    MOV     #MSG00,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
002236 005037 001174                    CLR     MODE
002242 004737 031700                    JSR     PC,SEND         ;NOW SEND THE MESSAGE
002246 004737 004216                    JSR     PC,SCAN         ;SIZE FOR TERMINALS
002252 005737 001120                    TST     SRCONT                  ;SWITCH CONTROL ?
002256 001402                           BEQ     4$                      ;YES-JUMP
002260 000137 002450                    JMP     LSEQ
002264 012737 002342 000060     4$:     MOV     #SEQM$,@#60             ;SU TTI RECV INTR VECTOR
002272 012737 000000 000062             MOV     #PRI0,@#62              ;PRI 0
002300                                  SENDC   #MSGK2                  ;PMT MODE MSG.
002300 012705 042125                    MOV     #MSGK2,R5               ;GET MESSAGE ADDRESS
002304 004737 020304                    JSR     PC,CSEND        ;SEND MESSAGE
002310 004737 034166                    JSR     PC,QUIET
002314 000001                           WAIT
002316                          SEQ8:           SENDC   #MSGK1                  ;SEND 'READY''
002316 012705 042113                    MOV     #MSGK1,R5               ;GET MESSAGE ADDRESS
002322 004737 020304                    JSR     PC,CSEND        ;SEND MESSAGE
002326                                  SENDC   #MSGK4                  ;'ENTER COMMANDS''
002326 012705 042164                    MOV     #MSGK4,R5               ;GET MESSAGE ADDRESS
002332 004737 020304                    JSR     PC,CSEND        ;SEND MESSAGE
002336 000001                   WSEQ:   WAIT
002340 000776                           BR      .-2
                                        ; MODE ANSWER AND TTY VECTOR SETUP
002342 113777 177562 176636     SEQM$:  MOVB    @#177562,@PNTR          ;GET INPUT ANSWER
002350 142777 000240 176630             BICB    #240,@PNTR              ;STRIP PARITY & LC
002356 122777 000120 176622             CMPB    #'P,@PNTR               ;PMT MODE ?
002364 001004                           BNE     2$                      ;NO- JUMP
002366 052737 100000 001176             BIS     #BIT15,PMODE            ;YES- FLAG IT
002374 000402                           BR      3$
002376 005037 001176            2$:     CLR     PMODE                   ;DMT MODE
002402 012737 017234 000060     3$:     MOV     #TTYIN,@#60             ;SET TTY IN VECTOR
002410 012737 000340 000062             MOV     #PRI7,@#62              ;PRIORITY 7
002416 005037 001160                    CLR     WORK
002422 117737 176560 001160             MOVB    @PNTR,WORK
002430                                  SENDC   #WORK                   ;ECHO THE CHARACTER
002430 012705 001160                    MOV     #WORK,R5                ;GET MESSAGE ADDRESS
002434 004737 020304                    JSR     PC,CSEND        ;SEND MESSAGE
002440 012737 000101 177560             MOV     #101,@#177560   ;CONSOLE ACTIVE
002446 000002                   4$:     RTI
```

```
 21100                                          ;INITIAL TEST STARTUP SEQUENCE
 21200
 21300 002450  005737  001120                   LSEQ:   TST     SRCONT                  ;SWITCH CONTROL ?
 21400 002454  001471                                   BEQ     20$                     ;NO-JUMP TO 20
 21500 002456  004737  004036                           JSR     PC,GETSWS               ;READ SWITCH REG.
 21600 002462  032737  002000  001116       1$:       BIT     #BIT10,SO               ;TEST NO. IN SWS ?
 21700 002470  001452                                   BEQ     13$                     ;NO- GOTO 13
 21800 002472  004737  003302                           JSR     PC,VALID                ;CHECK VALIDITY
 21900 002476  005737  001214                           TST     GO
 22000 002502  001433                                   BEQ     10$                     ;NO GOOD GOTO 10
 22100 002504  004737  003356                           JSR     PC,GETTST               ;TEST ADDR & INFO
 22200 002510  004737  003460                           JSR     PC,MODCON               ;MODE CONFLICT ?
 22300 002514  005737  001214                           TST     GO
 22400 002520  001402                                   BEQ     3$                      ;YES- GOTO 3
 22500 002522  000137  002730                 2$:       JMP     40$                     ;OK- GO START TEST
 22600 002526  032737  010000  001116       3$:       BIT     #BIT12,SO               ;SEQUENCE TESTS ?
 22700 002534  001412                                   BEQ     5$                  ;YES GOTO 5
 22800 002536  005037  001214                 4$:       CLR     GO
 22900 002542                                           SENDALL #MSGS2              ;ERROR MODE CONFLICT *****
       002542  012705  042336                           MOV     #MSGS2,R5           ;BUILD SEND CALL USING MESSAGE ADDRESS
       002546  005037  001174                           CLR     MODE
       002552  004737  031700                           JSR     PC,SEND             ;NOW SEND THE MESSAGE
 23000 002556  000137  002730                           JMP     40$
 23100 002562  105237  001116                 5$:       INCB    SO                          ;TRY NEXT TEST
 23200 002566  000137  002462                           JMP     1$
 23300
 23400 002572                                 10$:      SENDALL #MSGS1              ;ERROR INVALID TEST NO. *****
       002572  012705  042300                           MOV     #MSGS1,R5           ;BUILD SEND CALL USING MESSAGE ADDRESS
       002576  005037  001174                           CLR     MODE
       002602  004737  031700                           JSR     PC,SEND             ;NOW SEND THE MESSAGE
 23500 002606  005037  001214                           CLR     GO
 23600 002612  000137  002730                           JMP     40$
 23700
 23800 002616  105037  001116                 13$:      CLRB    SO                  ;SU FOR TEST 0
 23900 002622  004737  003356                           JSR     PC,GETTST                   ;TEST ADDR & INFO
 24000 002626  012737  000001  001214                   MOV     #1,GO
 24100 002634  000137  002730                           JMP     40$
 24200
 24300                                          ; CONSOLE CONTROL SECTION
 24400
 24500 002640  004737  003356                 20$:      JSR     PC,GETTST                   ;GET TEST ADDR & INFO
 24600 002644  004737  003460                           JSR     PC,MODCON                   ;MODE CONFLICT ?
 24700 002650  005737  001214                           TST     GO
 24800 002654  001402                                   BEQ     25$                         ;YES- GOTO 25
 24900 002656  000137  002730                 21$:      JMP     40$                         ;GO START TEST
 25000 002662  004737  004104                 25$:      JSR     PC,ANYWAY                   ;RUN ANYWAY ?
 25100 002666  042705  000240                           BIC     #240,R5
 25200 002672  122705  000131                           CMPB    #'Y,R5
 25300 002676  001411                                   BEQ     27$                         ;YES GOTO 27
 25400 002700                                           SENDC   #MSGK1                      ;SEND 'READY'
       002700  012705  042113                           MOV     #MSGK1,R5                   ;GET MESSAGE ADDRESS
       002704  004737  020304                           JSR     PC,CSEND            ;SEND MESSAGE
 25500 002710  012737  177777  001214                   MOV     #-1,GO                      ;GO BACK TO WAIT
 25600 002716  000137  002730                           JMP     40$
 25700 002722  112737  000001  001214       27$:      MOVB    #1,GO
 25800 002730  005737  001214                 40$:      TST     GO
 25900 002734  001405                                   BEQ     43$
```

```
CZLAIAO LA00 DMT PROG   MACRO M1110  20-APR-78 04:21  PAGE 8-1                                                SEQ 0029
START POINT FOR PROGRAM

  26000 002736  100002                                    BPL     42$
  26100 002740  000137  002336                    41$:    JMP     WSEQ            ;WAIT FOR NEW COMMANDS
  26200 002744  000137  002754                    42$:    JMP     RSEQ            ;START TESTING
  26300 002750  000137  002450                    43$:    JMP     LSEQ            ;GET NEW TEST DATA FROM SWS
  26400
```

```
26600
26700                                   ;TEST RUN & POST RUN CONTROL
26800
26900 002754  004737  033000            RSEQ:   JSR     PC,RESETO       ;RESET THE TERMINALS
27000 002760  005737  001216                    TST     UUT             ;ANY TERMINALS TO TEST ?
27100 002764  001474                            BEQ     91$
27200 002766                            SENDALL #MSG75
      002766  012705  037154                    MOV     #MSG75,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
      002772  005037  001174                    CLR     MODE
      002776  004737  031700                    JSR     PC,SEND         ;NOW SEND THE MESSAGE
27300 003002  004777  176106                    JSR     PC,@TEST        ;GO DO TEST >->->->->->->->->->
27400 003006  004737  034166                    JSR     PC,QUIET        ;WAIT TILL DONE
27500 003012  005277  176074                    INC     @SEQ            ;PASS COUNT +1
27600 003016  004737  003510                    JSR     PC,EOPT         ;REPORT PASS DONE
27700 003022  005737  001120                    TST     SRCONT          ;SWITCH CONTROL ?
27800 003026  001433                            BEQ     5$              ;NO- GO TO 5
27900 003030  017737  176066  001160            MOV     @SWR,WORK
28000 003036  032737  001000  001160            BIT     #BIT9,WORK
28100 003044  001404                            BEQ     1$              ;CHECK SWITCH REG FOR CHANGES
28200 003046  052737  100000  001176            BIS     #BIT15,PMODE
28300 003054  000402                            BR      2$
28400 003056  005037  001176            1$:     CLR     PMODE
28500 003062  042737  007377  001160    2$:     BIC     #007377,WORK    ;LOOK AT BITS 15,14,13, &8
28600 003070  053737  001160  001116            BIS     WORK,SO
28700 003076  005137  001160                    COM     WORK
28800 003102  042737  007377  001160            BIC     #007377,WORK
28900 003110  043737  001160  001116            BIC     WORK,SO
29000 003116  032737  010000  001116    5$:     BIT     #BIT12,SO       ;SEQUENCE TESTS ?
29100 003124  001423                            BEQ     10$             ;YES- JUMP TO 10
29200 003126  032737  000400  001116    6$:     BIT     #BIT8,SO        ;END OF TEST HALT ?
29300 003134  001406                            BEQ     9$              ;NO JUMP
29400 003136  005737  001120                    TST     SRCONT          ;SWITCH CONTROL ?
29500 003142  001401                            BEQ     8$              ;NO JUMP
29600 003144  000000                            HALT            ; END OF TEST ..........................
29700 003146  000137  002316            8$:     JMP     SEQ8            ;GET NEW CONTROL INFO
29800 003152  000137  002754            9$:     JMP     RSEQ            ;RESTART TEST
29900
30000 003156                            91$:    SENDC   #MSGK6          ;NO TERMINALS SELECTED ...
      003156  012705  042244                    MOV     #MSGK6,R5               ;GET MESSAGE ADDRESS
      003162  004737  020304                    JSR     PC,CSEND        ;SEND MESSAGE
30100 003166  000000                            HALT
30200 003170  000137  002220                    JMP     ISEQ
30300 003174  105237  001116            10$:    INCB    SO              ;POINT TO NEXT TEST
30400 003200  004737  003356                    JSR     PC,GETTST       ;GET TEST ADDR & INFO
30500 003204  023727  001114  177777            CMP     TEST,#-1        ;END OF TABLE ?
30600 003212  001407                            BEQ     15$             ;YES- JUMP
30700 003214  004737  003460                    JSR     PC,MODCON       ;CHECK MODE
30800 003220  005737  001214                    TST     GO
30900 003224  001763                            BEQ     10$             ;BAD- TRY NEXT TEST
31000 003226  000137  002754            11$:    JMP     RSEQ            ;OK GO DO NEXT TEST
31100
31200 003232  005237  001124            15$:    INC     PASSNO          ;PASS NUMBER +1
31300 003236  004737  003634                    JSR     PC,EOP          ;REPORT PASS COMPLETE
31400 003242  032737  000400  001116    16$:    BIT     #BIT8,SO        ;END OF PASS HALT ?
31500 003250  001406                            BEQ     19$             ;NO- JUMP
31600 003252  005737  001120                    TST     SRCONT          ;SWITCH CONTROL ?
31700 003256  001401                            BEQ     17$             ;NO JUMP
```

```
 31800 003260  000000                          HALT            ;END OF PASS .....................
 31900 003262  000137  002450          17$:    JMP     LSEQ            ;GET NEW TEST NO. ETC.
 32000
 32100 003266  105037  001116          19$:    CLRB    SO              ;SET TEST 0
 32200 003272  004737  003356                  JSR     PC,GETTST
 32300 003276  000137  002754          22$:    JMP     RSEQ            ;START TEST.....
 32400
 32500
 32600 003302  005037  001214          VALID:  CLR     GO
 32700 003306  105737  001116                  TSTB    SO
 32800 003312  002407                          BLT     4$
 32900 003314  123727  001116  000022          CMPB    SO,#22
 33000 003322  003003                          BGT     4$
 33100 003324  012737  000001  001214          MOV     #1,GO
 33200 003332  000207                  4$:     RTS     PC
 33300
 33400 003334  105037  001214          REAL:   CLRB    GO
 33500 003340  005737  001212                  TST     TSTTYP
 33600 003344  100403                          BMI     1$
 33700 003346  012737  000001  001214          MOV     #1,GO
 33800 003354  000207                  1$:     RTS     PC
 33900
 34000 003356  005037  001160          GETTST: CLR     WORK
 34100 003362  005037  001112                  CLR     SEQ
 34200 003366  113737  001116  001160          MOVB    SO,WORK
 34300 003374  006337  001160                  ASL     WORK
 34400 003400  063737  001160  001112          ADD     WORK,SEQ
 34500 003406  006337  001112                  ASL     SEQ
 34600 003412  063737  001160  001112          ADD     WORK,SEQ
 34700 003420  062737  004424  001112          ADD     #TSTTBL,SEQ
 34800 003426  017737  175460  001114          MOV     @SEQ,TEST
 34900 003434  062737  000002  001112          ADD     #2,SEQ
 35000 003442  017737  175444  001212          MOV     @SEQ,TSTTYP
 35100 003450  062737  000002  001112          ADD     #2,SEQ          ;POINT TO PASS NO.
 35200 003456  000207                          RTS     PC
 35300
 35400 003460  112737  000001  001214  MODCON: MOVB    #1,GO
 35500 003466  005737  001176                  TST     PMODE
 35600 003472  001405                          BEQ     2$
 35700 003474  105737  001212                  TSTB    TSTTYP
 35800 003500  100002                          BPL     2$
 35900 003502  005037  001214                  CLR     GO
 36000 003506  000207                  2$:     RTS     PC
 36100
 36200                                 ;END OF TEST PASS ROUTINE
 36300
 36400 003510  005037  001134          EOPT:   CLR TEMP                ;CONVERT TEST NO TO ASCII
 36500 003514  113737  001116  001134          MOVB    SO,TEMP
 36600 003522  012705  020574                  MOV     #EBUF,R5
 36700 003526  004737  033646                  JSR     PC,BIOCT
 36800 003532  113737  020600  034672          MOVB    EBUF+4,MSG03+23.        ;PUT IN MSG03
 36900 003540  113737  020601  034673          MOVB    EBUF+5,MSG03+24.
 37000 003546  017737  175340  001134          MOV     @SEQ,TEMP               ;CONVERT PASS NO.
 37100 003554  012705  020574                  MOV     #EBUF,R5
 37200 003560  004737  033646                  JSR     PC,BIOCT
 37300 003564  113737  020577  034661          MOVB    EBUF+3,MSG03+14.        ;PUT IN MSG03
 37400 003572  113737  020600  034662          MOVB    EBUF+4,MSG03+15.
```

```
003600  113737  020601  034663          MOVB     EBUF+5,MSG03+16.
003606                                  SENDALL  #MSG03                   ;REPORT END OF TEST PASS
003606  012705  034643                  MOV      #MSG03,R5         ;BUILD SEND CALL USING MESSAGE ADDRESS
003612  005037  001174                  CLR      MODE
003616  004737  031700                  JSR      PC,SEND           ;NOW SEND THE MESSAGE
003622                                  SENDC    #MSG03
003622  012705  034643                  MOV      #MSG03,R5                ;GET MESSAGE ADDRESS
003626  004737  020304                  JSR      PC,CSEND          ;SEND MESSAGE
003632  000207                          RTS      PC



                                ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                ;END OF PASS SUBROUTINE
003634                          EOP:    SENDALL  #MSG01
003634  012705  034624                  MOV      #MSG01,R5         ;BUILD SEND CALL USING MESSAGE ADDRESS
003640  005037  001174                  CLR      MODE
003644  004737  031700                  JSR      PC,SEND           ;NOW SEND THE MESSAGE
003650                                  SENDC    #MSG01
003650  012705  034624                  MOV      #MSG01,R5                ;GET MESSAGE ADDRESS
003654  004737  020304                  JSR      PC,CSEND          ;SEND MESSAGE
003660  013737  001124  001134          MOV      PASSNO,TEMP       ;CONVERT PASS NO TO ASCII
003666  012705  020574                  MOV      #EBUF,R5
003672  004737  033646                  JSR      PC,BIOCT
003676  105037  020602                  CLRB     EBUF+6            ;PRINT PASS NO.
003702                                  SENDALL  #EBUF
003702  012705  020574                  MOV      #EBUF,R5          ;BUILD SEND CALL USING MESSAGE ADDRESS
003706  005037  001174                  CLR      MODE
003712  004737  031700                  JSR      PC,SEND           ;NOW SEND THE MESSAGE
003716                                  SENDC    #EBUF
003716  012705  020574                  MOV      #EBUF,R5                 ;GET MESSAGE ADDRESS
003722  004737  020304                  JSR      PC,CSEND          ;SEND MESSAGE
003726                                  SENDALL  #MSG75            ;SEND CRLF
003726  012705  037154                  MOV      #MSG75,R5         ;BUILD SEND CALL USING MESSAGE ADDRESS
003732  005037  001174                  CLR      MODE
003736  004737  031700                  JSR      PC,SEND           ;NOW SEND THE MESSAGE
003742                                  SENDC    #MSG75
003742  012705  037154                  MOV      #MSG75,R5                ;GET MESSAGE ADDRESS
003746  004737  020304                  JSR      PC,CSEND          ;SEND MESSAGE
003752  000207                          RTS      PC                ;RETURN

                                ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                ;  TEST FOR HARDWARE SWITCH REGISTER
                                ;  SWR - 176 IF NONE ON SYSTEM

003754  012737  004002  000004  SWRTST: MOV      #2$,TRAP4
003762  012737  000340  000006          MOV      #PRI7,TRAP4+2
003770  017737  175126  001116  1$:     MOV      @SWR,SO
003776  000240                          NOP
004000  000407                  BR      3$
004002  012737  000176  001122  2$:     MOV      #176,SWR          ;TRAPPED TO 4 SET UP FOR
004010  017737  175106  001116          MOV      @SWR,SO           ;SOFTWARE SWITCH REG.
004016  000002                          RTI
004020  012737  000006  000004  3$:     MOV      #6,TRAP4          ;RESET TRAP CATCHER
004026  012737  000000  000006          MOV      #0,TRAP4+2
004034  000207                          RTS      PC
```

```
                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                        ; ROUTINE TO GET SWITCHES

004036  023727  001122  000176          GETSWS: CMP     SWR,#000176                     ;REAL SWS ?
004044  001001                                  BNE     3$                              ;YES SKIP HALT
004046  000000                                  HALT                    ;ALLOW OPERATOR TO CHANGE 176
004050  017737  175046  001116          3$:     MOV     @SWR,SO         ;READ SWS TO WORK COPY
004056  032737  001000  001116                  BIT     #BIT9,SO        ;PMT MODE ?
004064  001404                                  BEQ     1$              ;NO
004066  052737  100000  001176                  BIS     #BIT15,PMODE    ;YES- SET THE FLAG
004074  000402                                  BR      2$
004076  005037  001176                  1$:     CLR     PMODE
004102  000207                          2$:     RTS     PC

                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                        ; ROUTINE TO HANDLE MODE CONFLICTS

004104  012737  004146  000060          ANYWAY: MOV     #3$,@#60        ;SET INTERRUPT TO 3$
004112  005005                                  CLR     R5
004114                                          SENDC   #MSGK5          ;RUN ANYWAY ? MSG
004114  012705  042212                          MOV     #MSGK5,R5                       ;GET MESSAGE ADDRESS
004120  004737  020304                          JSR     PC,CSEND        ;SEND MESSAGE
004124                                          STALL   #10000.
004124  012705  023420                          MOV     #10000.,R5                      ;SETUP STALL TIME CONSTANT
004130  004737  033614                          JSR     PC,MSTALL
004134  105705                                  TSTB    R5
004136  001002                                  BNE     2$
004140  112705  000116                  1$:     MOVB    #'N,R5          ;ASSUME NO OF NO ANS
004144  000207                          2$:     RTS     PC

004146  113705  177562                  3$:     MOVB    @#177562,R5     ;GET ANS
004152  012737  017234  000060                  MOV     #TTYIN,@#60     ;RESTORE TTY INTR HANDLER
004160  105737  177564                  4$:     TSTB    @#177564
004164  100375                                  BPL     4$              ;ECHO THE CHAR
004166  110537  177566                          MOVB    R5,@#177566
004172                                          SENDC   #MSG75
004172  012705  037154                          MOV     #MSG75,R5                       ;GET MESSAGE ADDRESS
004176  004737  020304                          JSR     PC,CSEND        ;SEND MESSAGE
004202  005037  001146                          CLR     LOOPO           ;ABORT THE TIMEOUT
004206  012737  000101  177560                  MOV     #101,@#177560   ;ENABLE CONSOLE
004214  000002                                  RTI
```

```
                                        ; THIS ROUTINE WILL SCAN ALL LINES FOR ACTIVE TERMINALS
                                        ; BE REQUESTING AN ANSWERBACK FROM ALL LINES. THE SELECT
                                        ; BIT WILL BE SET ACCORDINGLY IN THE DZLINE TABLE.
004216  012737  004410  001140  SCAN:   MOV     #5$,HOOK        ;LINK TO RECV ROUTINE
004224                          SENDALL #MSG05          ;PROMPT TERMINALS
004224  012705  034741          MOV     #MSG05,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
004230  005037  001174          CLR     MODE
004234  004737  031700          JSR     PC,SEND         ;NOW SEND THE MESSAGE
004240                          STALL   #6000.          ;WAIT A WHILE
004240  012705  013560          MOV     #6000.,R5               ;SETUP STALL TIME CONSTANT
004244  004737  033614          JSR     PC,MSTALL
004250  005037  001160          CLR     WORK
004254  023737  001160  001152  1$:     CMP     WORK,NUMLIN     ;ALL LINES DONE ?
004262  001424                  BEQ     4$              ;YES- EXIT
004264  013700  001160          MOV     WORK,R0
004270  006300                  ASL     R0              ;X2 FOR WORD OFFSET
004272  005760  020626          TST     DZLINE(R0)      ;BIT 15 SHOULD BE SET
004276  100006                  BPL     3$              ;NO RESPONSE- DESELECT
004300  042760  100200  020626  BIC     #100200,DZLINE(R0)
004306  005237  001160          INC     WORK            ;CHECK NEXT LINE
004312  000760                  BR      1$
004314  052760  000200  020626  3$:     BIS     #BIT7,DZLINE(R0)        ;SET LINE INACTIVE
004322  005060  024046          CLR     ACTIVE(R0)
004326  005237  001160          INC     WORK
004332  000750                  BR      1$              ;CHECK NEXT LINE
004334  005037  001140  4$:     CLR     HOOK
004340  005037  001204          CLR     ONLINE
004344  005037  001216          CLR     UUT
004350  023737  001204  001152  6$:     CMP     ONLINE,NUMLIN
004356  001413                  BEQ     8$
004360  013700  001204          MOV     ONLINE,R0
004364  006300                  ASL     R0
004366  105760  020626          TSTB    DZLINE(R0)
004372  100402                  BMI     7$
004374  005237  001216          INC     UUT
004400  005237  001204  7$:     INC     ONLINE
004404  000761                  BR      6$
004406  000207          8$:     RTS     PC

004410  004737  033364  5$:     JSR     PC,KBOUT                ;REMOVE CHAR FROM BUFFER
004414  052760  100000  020626          BIS     #BIT15,DZLINE(R0)       ;SET RESPONDED BIT
004422  000207                  RTS     PC
```

```
                                        .SBTTL  TEST SEQUENCE TABLE
                                        ;ONE WORD OF TEST ADDRESS
                                        ;ONE WORD OF TEST DESCRIPTION DATA
                                        ;       BIT7   TEST MANUAL INTERVENTION
                                        ;       BIT4:0 TEST NUMBER
                                        ;ONE WORD OF PASS COUNT

004424                                  TSTTBL:
004424  005410                                  TEST00          ;DATA PATHS TEST
004426  000000                                  000000
004430  000000                                  000000
004432  005452                                  TEST01          ;ALL PRINTABLE CHARACTERS TEST
004434  000001                                  000001
004436  000000                                  000000
004440  005700                                  TEST02          ;NON-PRINTABLE CHARACTERS TEST
004442  000002                                  000002
004444  000000                                  000000
004446  005732                                  TEST03          ;PRINTHEAD DOT MATRIX TEST
004450  000003                                  000003
004452  000000                                  000000
004454  006040                                  TEST04          ;HORIZONTAL PITCH TEST
004456  000004                                  000004
004460  000000                                  000000
004462  006412                                  TEST05          ;SPACE - BACKSPACE TEST
004464  000005                                  000005
004466  000000                                  000000
004470  006610                                  TEST06          ;SET MARGINS TEST
004472  000006                                  000006
004474  000000                                  000000
004476  007520                                  TEST07          ;HORIZONTAL TABS TEST
004500  000007                                  000007
004502  000000                                  000000
004504  010072                                  TEST10          ;MULTIPLE LINE FEED TEST
004506  000010                                  000010
004510  000000                                  000000
004512  010464                                  TEST11          ;HORIZONTAL MOTION TEST
004514  000011                                  000011
004516  000000                                  000000
004520  011164                                  TEST12          ;BUFFER OVERRUN TEST
004522  000012                                  000012
004524  000000                                  000000
004526  011630                                  TEST13          ;VERTICAL PITCH TEST
004530  000013                                  000013
004532  000000                                  000000
004534  012170                                  TEST14          ;BELL TEST
004536  000014                                  000014
004540  000000                                  000000
004542  015676                                  TEST15          ;LIFE TEST
004544  000015                                  000015
004546  000000                                  000000
004550  016334                                  TEST16          ;DYNAMIC EXERCISOR
004552  000016                                  000016
004554  000000                                  000000
004556  004612                                  TEST17          ;BAUD RATE TEST
004560  000217                                  000217
```

```
 5800 004562  000000                    000000
 5900 004564  012260                    TEST20          ;DMT KEYBOARD ECHO TEST
 6000 004566  000220                    000220
 6100 004570  000000                    000000
 6200 004572  014412                    TEST21          ;DMT CHARACTER CODE ECHO TEST
 6300 004574  000221                    000221
 6400 004576  000000                    000000
 6500 004600  015214                    TEST22          ;DMT PITCH SETUP TEST
 6600 004602  000222                    000222
 6700 004604  000000                    000000
 7400 004606  177777                    177777  ;END OF TABLE FLAG
 7500 004610  000000                    000000
 7600
```

```
 7800                                            .SBTTL  TESTS
 7900                                    ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
 8000                                    ;THIS IS A TEST OF THE VARIOUS BAUD RATES.
 8100                                    ;MANUAL INTERVENTION IS REQUIRED
 8200                                    ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
 8300 004612                             TEST17: SENDALL #MSG27
      004612  012705  035546                     MOV     #MSG27,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
      004616  005037  001174                     CLR     MODE
      004622  004737  031700                     JSR     PC,SEND         ;NOW SEND THE MESSAGE
 8400 004626  012703  035636                     MOV     #MSG30,R3       ;SETUP ADDRESS OF 1ST PART OF MESSAGE
 8500 004632  012704  035660                     MOV     #MSG31,R4       ;SETUP ADDRESS OF 'HIT RETURN WHEN DONE'' MESSAGE
 8600 004636  012702  005374                     MOV     #T03TBL,R2      ;SETUP TABLE ADDRESS
 8700 004642  004737  033442                     JSR     PC,ANVENT       ;GO THRU ALL TABLE ENTRIES
 8800 004646                                     SENDALL #MSG88          ;PRINTED AT MSG
      004646  012705  037463                     MOV     #MSG88,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
      004652  005037  001174                     CLR     MODE
      004656  004737  031700                     JSR     PC,SEND         ;NOW SEND THE MESSAGE
 8900 004662                                     SENDALL #MSG32          ;110
      004662  012705  035743                     MOV     #MSG32,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
      004666  005037  001174                     CLR     MODE
      004672  004737  031700                     JSR     PC,SEND         ;NOW SEND THE MESSAGE
 9000 004676                                     SENDALL #MSG36          ;BAUD
      004676  012705  036116                     MOV     #MSG36,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
      004702  005037  001174                     CLR     MODE
      004706  004737  031700                     JSR     PC,SEND         ;NOW SEND THE MESSAGE
 9100 004712  004737  005004                     JSR     PC,5$           ;GET ANSWER BACK
 9200 004716  012702  005402                     MOV     #T03TB2,R2      ;SU NEXT PASS
 9300 004722  004737  033442                     JSR     PC,ANVENT       ;GO THRU TABLE AGAIN
 9400 004726                                     SENDALL #MSG88          ;PRINTED AT
      004726  012705  037463                     MOV     #MSG88,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
      004732  005037  001174                     CLR     MODE
      004736  004737  031700                     JSR     PC,SEND         ;NOW SEND THE MESSAGE
 9500 004742                                     SENDALL #MSG35          ;300
      004742  012705  036112                     MOV     #MSG35,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
      004746  005037  001174                     CLR     MODE
      004752  004737  031700                     JSR     PC,SEND         ;NOW SEND THE MESSAGE
 9600 004756                                     SENDALL #MSG36          ;BAUD
      004756  012705  036116                     MOV     #MSG36,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
      004762  005037  001174                     CLR     MODE
      004766  004737  031700                     JSR     PC,SEND         ;NOW SEND THE MESSAGE
 9700 004772  004737  005004                     JSR     PC,5$           ;GET ANSWER BACK
 9800 004776  005037  001140                     CLR     HOOK
 9900 005002  000207                             RTS     PC
10000
10100 005004  000240                     5$:     NOP
10200 005006  005037  001204                     CLR     ONLINE          ;INIT LINE 0
10300 005012  012737  034746  001160             MOV     #MSG06,WORK     ;SHOULD BE MESSAGE
10400 005020  023737  001204  001152     6$:     CMP     ONLINE,NUMLIN   ;DO ALL LINES
10500 005026  002402                             BLT     66$
10600 005030  000137  005372                     JMP     20$
10700 005034  013700  001204             66$:    MOV     ONLINE,R0
10800 005040  006300                             ASL     R0
10900 005042  105760  020626                     TSTB    DZLINE(R0)      ;IS LINE SELECTED /
11000 005046  100003                             BPL     61$
11100 005050  005237  001204                     INC     ONLINE          ;NO TRY AGAIN
11200 005054  000761                             BR      6$
11300 005056  000240                     61$:    NOP
```

```
11400 005060 005037 010070                      CLR     COUNT           ;INPUT CHAR COUNT =0
11500 005064 012737 016320 001162               MOV     #T30BUF,WORK1   ;BORROW A BUFFER AREA
11600 005072 012737 177777 001136               MOV     #-1,NOTYET      ;GETS CLEARED WHENE DONE
11700 005100 012737 005220 001140               MOV     #10$,HOOK       ;LINK TO RECV ROUTINE
11800 005106                                    SENDI   #MSG05,ONLINE   ;ESCAPE SEQ TO TERMINAL
      005106 012705 034741                      MOV     #MSG05,R5               ;MESSAGE ADDRESS TO R5
      005112 112737 000010 001175               MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
      005120 113737 001204 001174               MOVB    ONLINE,MODE             ;SELECTED LINE NO.
      005126 004737 031700                      JSR     PC,SEND
11900 005132 004737 034166                      JSR     PC,QUIET
12000 005136                                    STALL   #2000.          ;ALLOW 2 SEC FOR ANSWERBACK
      005136 012705 003720                      MOV     #2000.,R5               ;SETUP STALL TIME CONSTANT
      005142 004737 033614                      JSR     PC,MSTALL
12100 005146 005737 001136                      TST     NOTYET          ;SHOULD BE CLR IF MSG RECVD
12200 005152 001004                             BNE     7$              ;GO REPORT ERROR
12300 005154 005237 001204                      INC     ONLINE          ;DO NEXT LINE
12400 005160 000137 005020                      JMP     6$
12500 005164 012746 034677              7$:     MOV     #MSG04,-(SP)            ;NO RESPONSE .
12600 005170 004737 020346                      JSR     PC,ERRORT
12700 005174 000240                             NOP
12800 005176 012746 035201              8$:     MOV     #MSG15,-(SP)    ;ERROR MESSAGE  ADDRESS
12900 005202 004737 020346                      JSR     PC,ERRORT       ;TO ERROR ROUTINE
13000 005206 000000                             HALT                    ;IF BIT15 IS SET
13100 005210 005237 001204                      INC     ONLINE          ;DO NEXT LINE
13200 005214 000137 005020                      JMP     6$
13300
13400 005220 000240                     10$:    NOP
13500 005222 042705 177600                      BIC     #177600,R5              ;CLEAR PARITY BIT
13600 005226 110577 173730                      MOVB    R5,@WORK1       ;SAVE IN BUFFER
13700 005232 005237 010070                      INC     COUNT           ;BUMP CHAR COUNT
13800 005236 005237 001162                      INC     WORK1           ;BUMP BUFFER POINTER
13900 005242 023727 010070 000007               CMP     COUNT,#7        ;LOOKING FOR 7 CHARS
14000 005250 001415                             BEQ     12$             ;GO COMPARE TO SHOULDBE
14100 005252 105760 031561                      TSTB    RECERR+1(R0)    ;ERROR SET ?
14200 005256 001407                             BEQ     11$
14300 005260 005060 031560                      CLR     RECERR(R0)      ;RESET THE ERROR FLAGS
14400 005264 012746 035201                      MOV     #MSG15,-(SP)    ;ERROR MSG ADDRESS
14500 005270 004737 020346                      JSR     PC,ERRORT       ;TO ERROR ROUTINE
14600 005274 000000                             HALT                    ;IF BIT15 IS SET
14700 005276 004737 033364              11$:    JSR     PC,KBOUT
14800 005302 000207                             RTS     PC                      ;WAIT FOR MORE
14900 005304 005037 001136              12$:    CLR     NOTYET          ;TURN OFF FOR NOW
15000 005310 012737 016320 001162               MOV     #T30BUF,WORK1   ;RESET BUFFER POINTER
15100 005316 005737 010070              13$:    TST     COUNT           ;COMPARE ALL 5 CHARS
15200 005322 001420                             BEQ     18$
15300 005324 127777 173630 173630               CMPB    @WORK,@WORK1
15400 005332 001007                             BNE     14$
15500 005334 005237 001160                      INC     WORK
15600 005340 005237 001162                      INC     WORK1
15700 005344 005337 010070                      DEC     COUNT
15800 005350 000762                             BR      13$
15900 005352 012746 040600              14$:    MOV     #MSG148,-(SP)
16000 005356 004737 020346                      JSR     PC,ERRORT
16100 005362 000240                             NOP
16200 005364 005237 001204              18$:    INC     ONLINE          ;TEST NEXT LINE
16300 005370 000613                             BR      6$
16400 005372 000207                     20$:    RTS     PC
```

```
005374  035743                      T03TBL: MSG32                       ;110 , ODD PARITY , 7 BIT
005376  011320                              11320
005400  000000                              000000
005402  036112                      T03TB2: MSG35                       ;300 BAUD , ODD PARITY , 7 BIT
005404  012720                              12720
005406  000000                              000000                      ;END OF TABLE

                               ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                    ;THIS IS THE TEST OF DATA PATHS WITHIN THE LA00
                                    ;THE *U*U PATTERN IS ALTERNATING 0 AND ONE BITS
                               ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
005410                              TEST00: SENDALL #MSG42              ;ANOUNCE TEST
005410  012705  036535                      MOV     #MSG42,R5           ;BUILD SEND CALL USING MESSAGE ADDRESS
005414  005037  001174                      CLR     MODE
005420  004737  031700                      JSR     PC,SEND             ;NOW SEND THE MESSAGE
005424                                      SENDR   #MSG43,#4
005424  012705  036571                      MOV     #MSG43,R5
005430  112737  000004  001174              MOVB    #4,MODE
005436  112737  000020  001175              MOVB    #20,MODE+1
005444  004737  031700                      JSR     PC,SEND
005450  000207                      4$:     RTS     PC
```

```
18500                                          ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
18600                                          ;PRINTABLE CHARACTERS TEST
18700                                          ;THIS TEST PRINTS FOUR OF EACH PRINTABLE CHARACTER.
18800                                          ;ASCII CODES 041 THRU 176.
18900                                          ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
19000
19100 005452                                   TEST01: SENDALL #MSG81          ;SEND TEST ID
      005452  012705  037231                           MOV     #MSG81,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
      005456  005037  001174                           CLR     MODE
      005462  004737  031700                           JSR     PC,SEND         ;NOW SEND THE MESSAGE
19200 005466  013737  001172  001160                   MOV     WIDTH,WORK
19300 005474  005037  010070                           CLR     COUNT
19400 005500  162737  000006  001160           1$:     SUB     #6,WORK         ;WORK - WIDTH / 6
19500 005506  003403                                   BLE     2$
19600 005510  005237  010070                           INC     COUNT
19700 005514  000771                                   BR      1$
19800 005516  012737  000041  001164           2$:     MOV     #41,WORK2               ;INIT ASCII CODES
19900 005524  013737  010070  001160                   MOV     COUNT,WORK
20000 005532  123727  001164  000177           3$:     CMPB    WORK2,#177              ;DO WHILE CHAR < 177
20100 005540  002050                                   BGE     8$
20200 005542  005737  001160                   4$:     TST     WORK            ;DO WHILE WORK > 0
20300 005546  003433                                   BLE     6$
20400 005550                                   5$:     SENDC2  WORK2,#4        ;SEND CHAR 4 TIMES
      005550  013705  001164                           MOV     WORK2,R5                ;GET CHAR TO R5
      005554  012737  000004  001174                   MOV     #4,MODE         ;GET REPEAT COUNT
      005562  112737  000020  001175                   MOVB    #20,MODE+1      ;SET REPEAT MODE
      005570  004737  032226                           JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
20500 005574                                           SENDC2  #40,#2          ;SEND 2 SPACES
      005574  012705  000040                           MOV     #40,R5          ;GET CHAR TO R5
      005600  012737  000002  001174                   MOV     #2,MODE         ;GET REPEAT COUNT
      005606  112737  000020  001175                   MOVB    #20,MODE+1      ;SET REPEAT MODE
      005614  004737  032226                           JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
20600 005620  004737  034166                           JSR     PC,QUIET
20700 005624  105237  001164                           INCB    WORK2           ;NEXT ASCII CODE
20800 005630  005337  001160                           DEC     WORK
20900 005634  000736                                   BR      3$
21000 005636                                   6$:     SENDALL #MSG75          ;CRLF
      005636  012705  037154                           MOV     #MSG75,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
      005642  005037  001174                           CLR     MODE
      005646  004737  031700                           JSR     PC,SEND         ;NOW SEND THE MESSAGE
21100 005652  013737  010070  001160                   MOV     COUNT,WORK      ;RESTORE WIDTH/6
21200 005660  000724                                   BR      3$
21300 005662                                   8$:     SENDALL #MSG77          ;SKIP 3 LINES
      005662  012705  037157                           MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
      005666  005037  001174                           CLR     MODE
      005672  004737  031700                           JSR     PC,SEND         ;NOW SEND THE MESSAGE
21400 005676  000207                                   RTS     PC
21500
21600
```

```
                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                        ;THIS IS THE NON PRINTING CHARACTER TEST.
                                        ;ALL NON-PRINTING CHARS ARE SENT TO THE LA00. THE RESULT SHOULD BE
                                        ;A BLANK LINE.
                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
005700                                  TEST02: SENDALL #MSG44
005700  012705  036670                          MOV     #MSG44,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
005704  005037  001174                          CLR     MODE
005710  004737  031700                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
005714                                          SENDALL #MSG45
005714  012705  037000                          MOV     #MSG45,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
005720  005037  001174                          CLR     MODE
005724  004737  031700                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
005730  000207                                  RTS     PC






                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                        ;DOT MATRIX TEST
                                        ;THIS TEST PRINTS FIVE CHARACTERS ''ZH*#$'' IN LINE.
                                        ;A LINE OF Z'S AND SPACES IS PRINTED, THEN THIS
                                        ;LINE IS OVERPRINTED WITH A LINE OF H'S AND SPACES,
                                        ;*'S AND SPACES , AND #'S AND SPACES. THIS OVERPRINT
                                        ;CREATES TEN BOXES THAT SHOULD BE ALL BLACK.
                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

005732                                  TEST03: SENDALL #MSG83          ;SEND TEST ID
005732  012705  037275                          MOV     #MSG83,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
005736  005037  001174                          CLR     MODE
005742  004737  031700                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
005746                                          SENDALL #MSG77          ;SKIP 3 LINES
005746  012705  037157                          MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
005752  005037  001174                          CLR     MODE
005756  004737  031700                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
005762                                          SENDALL #MSG84          ;SEND THE CHARS
005762  012705  037322                          MOV     #MSG84,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
005766  005037  001174                          CLR     MODE
005772  004737  031700                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
005776                                  2$:     SENDR   #MSG85,#4       ;MAKE 4 LINES OF 10 BOXES
005776  012705  037334                          MOV     #MSG85,R5
006002  112737  000004  001174                  MOVB    #4,MODE
006010  112737  000020  001175                  MOVB    #20,MODE+1
006016  004737  031700                          JSR     PC,SEND
006022                                  5$:     SENDALL #MSG77          ;SKIP 3 LINES
006022  012705  037157                          MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
006026  005037  001174                          CLR     MODE
006032  004737  031700                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
006036  000207                                  RTS     PC
```

```
                                    ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                    ;HORIZONTAL PI¯CH TEST
                                    ;SETUP FOR THIS TEST IS DOWN LINE LOADED FROM THE PROGRAM.
                                    ;A MESSAGE WILL BE PRINTED IDENTIFYING THE CURRENT PITCH,
                                    ;FOLLOWED BY THREE LINES OF  A..Z AT THE CURRENT PITCH.
                                    ;PITCHES TESTED : 10, 12, 13.2, 16.5 CPI. ALL AT  6 LPI.
                                    ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

006040                              TEST04: SENDALL #MSG109         ;SEND TEST ID
006040  012705  037704                      MOV     #MSG109,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
006044  005037  001174                      CLR     MODE
006050  004737  031700                      JSR     PC,SEND         ;NOW SEND THE MESSAGE
006054                                      SENDALL #MSG77                  ;3 LINES
006054  012705  037157                      MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
006060  005037  001174                      CLR     MODE
006064  004737  031700                      JSR     PC,SEND         ;NOW SEND THE MESSAGE
006070  005037  001160                      CLR     WORK
006074  023727  001160  000006      1$:     CMP     WORK,#6.
006102  003122                              BGT     4$              ;DO WHILE WORK > 0
006104  005037  001164                      CLR     WORK2
006110  005037  006366                      CLR     T11A
006114  005037  006370                      CLR     T11B
006120  013737  001160  006366              MOV     WORK,T11A               ;GET TABLE OFFSET
006126  013737  006366  006370              MOV     T11A,T11B
006134  062737  006402  006370              ADD     #TABLHF,T11B            ;POINTER TO FORMAT CMD
006142  062737  006372  006366              ADD     #TABLH,T11A             ;POINTER TO ID MSG
006150                                      SENDALL @T11B           ;SETUP HORIZ PITCH
006150  017705  000214                      MOV     @T11B,R5        ;BUILD SEND CALL USING MESSAGE ADDRESS
006154  005037  001174                      CLR     MODE
006160  004737  031700                      JSR     PC,SEND         ;NOW SEND THE MESSAGE
006164                                      STALL   #250
006164  012705  000250                      MOV     #250,R5         ;SETUP STALL TIME CONSTANT
006170  004737  033614                      JSR     PC,MSTALL
006174                              2$:     SENDALL #MSG75          ;SEND CRLF
006174  012705  037154                      MOV     #MSG75,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
006200  005037  001174                      CLR     MODE
006204  004737  031700                      JSR     PC,SEND         ;NOW SEND THE MESSAGE
006210                                      SENDALL #MSG88                  ;SEND ID MESSAGE
006210  012705  037463                      MOV     #MSG88,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
006214  005037  001174                      CLR     MODE
006220  004737  031700                      JSR     PC,SEND         ;NOW SEND THE MESSAGE
006224                                      SENDALL @T11A
006224  017705  000136                      MOV     @T11A,R5        ;BUILD SEND CALL USING MESSAGE ADDRESS
006230  005037  001174                      CLR     MODE
006234  004737  031700                      JSR     PC,SEND         ;NOW SEND THE MESSAGE
006240                                      SENDALL #MSG93
006240  012705  037537                      MOV     #MSG93,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
006244  005037  001174                      CLR     MODE
006250  004737  031700                      JSR     PC,SEND         ;NOW SEND THE MESSAGE
006254                                      SENDALL #MSG96
006254  012705  037555                      MOV     #MSG96,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
006260  005037  001174                      CLR     MODE
006264  004737  031700                      JSR     PC,SEND         ;NOW SEND THE MESSAGE
006270                                      SENDALL #MSG98
006270  012705  037565                      MOV     #MSG98,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
006274  005037  001174                      CLR     MODE
006300  004737  031700                      JSR     PC,SEND         ;NOW SEND THE MESSAGE
```

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 27900 006304                                          SENDALL #MSG107
       006304  012705  037642                         MOV     #MSG107,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
       006310  005037  001174                         CLR     MODE
       006314  004737  031700                         JSR     PC,SEND         ;NOW SEND THE MESSAGE
 28000 006320  023727  001164  000003                 CMP     WORK2,#3
 28100 006326  003003                                  BGT     3$
 28200 006330  005237  001164                         INC     WORK2
 28300 006334  000717                                 BR      2$
 28400 006336  062737  000002  001160          3$:    ADD     #2,WORK                 ;GET NEXT PITCH
 28500 006344  000137  006074                         JMP     1$
 28600 006350                                  4$:    SENDALL #MSG77
       006350  012705  037157                         MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       006354  005037  001174                         CLR     MODE
       006360  004737  031700                         JSR     PC,SEND         ;NOW SEND THE MESSAGE
 28700 006364  000207                                 RTS     PC                      ;EXIT...
 28800
 28900 006366  000000                          T11A:  .WORD   000000
 29000 006370  000000                          T11B:  .WORD   000000
 29100 006372  037532  037525  037520          TABLH: .WORD   MSG92,MSG91,MSG90,MSG89
       006400  037513
 29200 006402  037572  037577  037604          TABLHF: .WORD  MSG99,MSG100,MSG101,MSG108
       006410  037677
 29300
 29400
 29500
```

```
                                                ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                                ;SPACE - BACKSPACE TEST
                                                ;THIS TEST PRINTS A LINE OF ALTERNATING SLASHES AND APACES.
                                                ;THEN BACKSPACES THROUGH THE LINE OVERPRINTING THE '/' S
                                                ;WITH '\'S. THE RESULTING LINE SHOULD BE A LINE OF ALTERNATING
                                                ;X'S AND SPACES. TWO LINES ARE PRINTED PER PASS.
                                                ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

006412                                          TEST05: SENDALL #MSG78          ;SEND TEST ID
006412  012705  037164                                  MOV     #MSG78,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
006416  005037  001174                                  CLR     MODE
006422  004737  031700                                  JSR     PC,SEND         ;NOW SEND THE MESSAGE
006426  012737  000002  010070                          MOV     #2,COUNT        ;SU FOR 2 LINES
006434  005737  010070                          2$:     TST     COUNT
006440  003454                                          BLE     7$              ;DO UNTIL COUNT -0
006442  013737  001172  001160                          MOV     WIDTH,WORK
006450  006237  001160                                  ASR     WORK
006454  162737  000002  001160                          SUB     #2,WORK         ;MAKE SHURE WE'RE NOT AT MARGIN
006462                                                  SENDR   #MSG79,WORK     ;SEND "/ "
006462  012705  037221                                  MOV     #MSG79,R5
006466  113737  001160  001174                          MOVB    WORK,MODE
006474  112737  000020  001175                          MOVB    #20,MODE+1
006502  004737  031700                                  JSR     PC,SEND
006506  000240                                          NOP
006510  000240                                          NOP
006512  013737  001172  001160                  4$:     MOV     WIDTH,WORK
006520  006237  001160                                  ASR     WORK            ;RESET COLM COUNT
006524                                                  SENDR   #MSG80,WORK     ;SEND 'BS BS \ BS"
006524  012705  037224                                  MOV     #MSG80,R5
006530  113737  001160  001174                          MOVB    WORK,MODE
006536  112737  000020  001175                          MOVB    #20,MODE+1
006544  004737  031700                                  JSR     PC,SEND
006550                                          6$:     SENDALL #MSG75          ;CRLF
006550  012705  037154                                  MOV     #MSG75,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
006554  005037  001174                                  CLR     MODE
006560  004737  031700                                  JSR     PC,SEND         ;NOW SEND THE MESSAGE
006564  005337  010070                                  DEC     COUNT
006570  000721                                          BR      2$
006572                                          7$:     SENDALL #MSG77          ;SKIP 3 LINES
006572  012705  037157                                  MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
006576  005037  001174                                  CLR     MODE
006602  004737  031700                                  JSR     PC,SEND         ;NOW SEND THE MESSAGE
006606  000207                                          RTS     PC              ;EXIT...
```

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                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                        ;SET MARGINS TEST
                                        ;       THIS TEST WILL SET 4 PAIRS OF L & R MARGINS
                                        ;       THEN WILL PRINT A LINE OF = SIGNS THAT SHOULD
                                        ;       BE WITHIN THOSE MARGINS. ALSO A MESSAGE WILL BE
                                        ;       SENT SPECIFYING AN ERROR IF IT'S NOT AT THE LH
                                        ;       MARGIN.
                                        ;       A REFERENCE LINE WILL BE PRINTED SHOWING THE
                                        ;       MARGIN LIMITS BEING SET UP.
                                        ;       ALL HORIZ PITCH SETTINGS WILL BE TESTED.

                                        ;EXAMPLE :       ......V.......................V........
                                        ;                      -=-==== =-===== --====-==-
                                        ;                      ERROR IF NOT AT LH MARGIN

                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
006610                                  TEST06: SENDALL #MSG111         ;SEND TEST ID
006610  012705  037770                          MOV     #MSG111,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
006614  005037  001174                          CLR     MODE
006620  004737  031700                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
006624  005037  001160                          CLR     WORK
006630  005037  001162                          CLR     WORK1
006634  005037  007512                          CLR     W1              ;DO 4 PITCH SETTINGS
006640  023727  007512  000003          1$:     CMP     W1,#3           ;IF DONE GOTO 30
006646  003402                                  BLE     4$
006650  000137  007432                          JMP     30$
006654  006337  007512                  4$:     ASL     W1              ;*2 FOR WORD OFFSET
006660  012737  006402  007516                  MOV     #TABLHF,W3      ;PITCH MSG TABLE
006666  063737  007512  007516                  ADD     W1,W3
006674                                          SENDALL @W3             ;SETUP H PITCH
006674  017705  000616                          MOV     @W3,R5  ;BUILD SEND CALL USING MESSAGE ADDRESS
006700  005037  001174                          CLR     MODE
006704  004737  031700                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
006710  006237  007512                          ASR     W1
006714  005037  007514                          CLR     W2              ;DO 5 MARGINS TESTS
006720  023727  007514  000004          2$:     CMP     W2,#4
006726  003402                                  BLE     5$
006730  000137  007422                          JMP     20$
006734                                  5$:     SENDALL #T12FIX         ;RESET MARGINS
006734  012705  007500                          MOV     #T12FIX,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
006740  005037  001174                          CLR     MODE
006744  004737  031700                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
006750  013737  007514  007516                  MOV     W2,W3
006756  006337  007516                          ASL     W3
006762  013701  007516                          MOV     W3,R1
006766  062701  007454                          ADD     #TBL12A,R1      ;POINT TO SETUP ADDR
006772  013737  007514  007516                  MOV     W2,W3
007000  062737  007466  007516                  ADD     #TBL12B,W3      ;POINT TO LH MARGIN
007006  117737  000504  001160                  MOVB    @W3,WORK        ;GET LH MARGIN
007014  013737  007514  007516                  MOV     W2,W3
007022  062737  007473  007516                  ADD     #TBL12C,W3      ;POINT TO RH MARGIN
007030  117737  000462  001162                  MOVB    @W3,WORK1       ;GET RH MARGIN
007036  123737  001162  001172                  CMPB    WORK1,WIDTH     ;WITHIN RANGE OF PAPER ?
007044  103405                                  BLO     3$
007046  012737  000005  007514                  MOV     #5,W2           ;NO DO NEXT PITCH GROUP
```

```
 37500 007054  000137  007422                        JMP     20$
 37600 007060  113737  001160  001164        3$:     MOVB    WORK,WORK2
 37700 007066  005337  001164                        DEC     WORK2
 37800 007072                                        SENDALL #MSG75          ;SEND CRLF
       007072  012705  037154                        MOV     #MSG75,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       007076  005037  001174                        CLR     MODE
       007102  004737  031700                        JSR     PC,SEND         ;NOW SEND THE MESSAGE
 37900 007106                                        SENDR   #MSG62,WORK2    ;PRINT PERIODS....
       007106  012705  037073                        MOV     #MSG62,R5
       007112  113737  001164  001174                MOVB    WORK2,MODE
       007120  112737  000020  001175                MOVB    #20,MODE+1
       007126  004737  031700                        JSR     PC,SEND
 38000 007132                                        SENDCH  #'V             ;PRINT A 'V'
       007132  012705  000126                        MOV     #'V,R5          ;GET CHAR TO R5
       007136  005037  001174                        CLR     MODE            ;STD MODE
       007142  004737  032226                        JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
 38100 007146  013737  001162  001164                MOV     WORK1,WORK2
 38200 007154  163737  001160  001164                SUB     WORK,WORK2      ; -RH-LH
 38300 007162  005337  001164                        DEC     WORK2
 38400 007166                                        SENDC2  #'.,WORK2       ;PRINT PERIODS
       007166  012705  000056                        MOV     #'.,R5          ;GET CHAR TO R5
       007172  013737  001164  001174                MOV     WORK2,MODE              ;GET REPEAT COUNT
       007200  112737  000020  001175                MOVB    #20,MODE+1      ;SET REPEAT MODE
       007206  004737  032226                        JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
 38500 007212                                        SENDCH  #'V             ;PRINT A 'V'
       007212  012705  000126                        MOV     #'V,R5          ;GET CHAR TO R5
       007216  005037  001174                        CLR     MODE            ;STD MODE
       007222  004737  032226                        JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
 38600 007226  013737  001172  001164                MOV     WIDTH,WORK2
 38700 007234  163737  001162  001164                SUB     WORK1,WORK2
 38800 007242                                        SENDC2  #'.,WORK2       ;PRINT MORE PERIODS
       007242  012705  000056                        MOV     #'.,R5          ;GET CHAR TO R5
       007246  013737  001164  001174                MOV     WORK2,MODE              ;GET REPEAT COUNT
       007254  112737  000020  001175                MOVB    #20,MODE+1      ;SET REPEAT MODE
       007262  004737  032226                        JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
 38900 007266  011137  001164                        MOV     (R1),WORK2
 39000 007272                                        SENDALL WORK2           ;SETUP MARGINS
       007272  013705  001164                        MOV     WORK2,R5        ;BUILD SEND CALL USING MESSAGE ADDRESS
       007276  005037  001174                        CLR     MODE
       007302  004737  031700                        JSR     PC,SEND         ;NOW SEND THE MESSAGE
 39100 007306  004737  034166                        JSR     PC,QUIET                ;WAIT FOR CATCHUP
 39200 007312                                        SENDALL #MSG75          ;SEND CRLF
       007312  012705  037154                        MOV     #MSG75,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       007316  005037  001174                        CLR     MODE
       007322  004737  031700                        JSR     PC,SEND         ;NOW SEND THE MESSAGE
 39300 007326                                        SENDR   #MSG115,#25.    ;SEND '-' 25 TIMES
       007326  012705  040043                        MOV     #MSG115,R5
       007332  112737  000031  001174                MOVB    #25.,MODE
       007340  112737  000020  001175                MOVB    #20,MODE+1
       007346  004737  031700                        JSR     PC,SEND
 39400 007352                                        SENDALL #MSG116         ;AND ERROR IF  MSG
       007352  012705  040045                        MOV     #MSG116,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
       007356  005037  001174                        CLR     MODE
       007362  004737  031700                        JSR     PC,SEND         ;NOW SEND THE MESSAGE
 39500 007366                                        SENDALL #MSG7           ;SEND CRLF
       007366  012705  037154                        MOV     #MSG75,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       007372  005037  001174                        CLR     MODE
```

```
        007376  004737  031700                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
 39600  007402                                          STALL   #300
        007402  012705  000300                          MOV     #300,R5         ;SETUP STALL TIME CONSTANT
        007406  004737  033614                          JSR     PC,MSTALL
 39700  007412  005237  007514                          INC     W2              ;NEXT MARGIN PAIR
 39800  007416  000137  006720                          JMP     2$
 39900  007422  005237  007512              20$:        INC     W1              ;NEXT H PITCH
 40000  007426  000137  006640                          JMP     1$
 40100  007432  004737  033000              30$:        JSR     PC,RESET0       ;RESET THE TERMINAL
 40200  007436                                          SENDALL #MSG77          ;SKIP 3 LINES
        007436  012705  037157                          MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
        007442  005037  001174                          CLR     MODE
        007446  004737  031700                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
 40300  007452  000207                                  RTS     PC              ;BYE....
 40400
 40500
 40600  007454  041234  041244  041255      TBL12A: .WORD   MSG180,MSG181,MSG182,MSG183,MSG184
        007462  041266  041300
 40700
 40800  007466     002     032     064      TBL12B: .BYTE   2,26.,52.,78.,100.
        007471     116     144
 40900  007473     032     062     114      TBL12C: .BYTE   26.,50.,76.,102.,124.
        007476     146     174
 41000  007500     033     133     061      T12FIX: .BYTE   33,133,61,73,61,63,62,163,0
        007503     073     061     063
        007506     062     163     000
 41100                                      .EVEN
 41200  007512  000000                      W1:     .WORD   0
 41300  007514  000000                      W2:     .WORD   0
 41400  007516  000000                      W3:     .WORD   0
 41500
 41600                                              .EVEN
 41700
 41800
```

```
                                    ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                    ;HORIZONTAL TABS TEST.
                                    ;A REFERENCE LINE IS PRINTED, MADE UP OF PERIODS AND V'S
                                    ;TAB STOPS ARE THEN SET CORRESPONDING TO THE POSITION OF
                                    ;THE V'S. THREE LINES OF TABS AND I'S ARE PRINTED, WHERE
                                    ;THE I'S SHOULD LINE UP UNDER THE V'S.
                                    ;THIS IS REPEATED FOR TAB SETTINGS OF 4,8,9,16,18,32, AND
                                    ;64 CHARACTER SPACES.
                                    ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;..;;

007520                              TEST07: SENDALL #MSG60  ;SEND TEST ID
007520  012705  037031                      MOV     #MSG60,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
007524  005037  001174                      CLR     MODE
007530  004737  031700                      JSR     PC,SEND         ;NOW SEND THE MESSAGE
007534  012737  010050  001164      1$:     MOV     #TABL13,WORK2
007542  013737  001172  001162      2$:     MOV     WIDTH,WORK1
007550                                      SENDALL #MSG61          ;ESC-2 RESETS TABS
007550  012705  037070                      MOV     #MSG61,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
007554  005037  001174                      CLR     MODE
007560  004737  031700                      JSR     PC,SEND         ;NOW SEND THE MESSAGE
007564  117737  171374  010066              MOVB    @WORK2,TAB
007572  005237  001164                      INC     WORK2
007576  105077  171362                      CLRB    @WORK2
007602  013701  010066                      MOV     TAB,R1
007606                                      SENDALL #MSG75          ;SEND CRLF
007606  012705  037154                      MOV     #MSG75,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
007612  005037  001174                      CLR     MODE
007616  004737  031700                      JSR     PC,SEND         ;NOW SEND THE MESSAGE
007622  163737  010066  001162      3$:     SUB     TAB,WORK1       ;SU TAB COUNT PER LINE
007630  002433                              BLT     6$
007632  005301                      4$:     DEC     R1              ;PRINT TAB -1 PERIODS
007634                                      SENDC2  #'.,R1          ;PRINT PERIODS
007634  012705  000056                      MOV     #'.,R5          ;GET CHAR TO R5
007640  010137  001174                      MOV     R1,MODE         ;GET REPEAT COUNT
007644  112737  000020  001175              MOVB    #20,MODE+1      ;SET REPEAT MODE
007652  004737  032226                      JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
007656                              5$:     SENDALL #MSG63          ;SET TAB STOP
007656  012705  037075                      MOV     #MSG63,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
007662  005037  001174                      CLR     MODE
007666  004737  031700                      JSR     PC,SEND         ;NOW SEND THE MESSAGE
007672                                      SENDCH  #'V             ;PRINT A 'V''
007672  012705  000126                      MOV     #'V,R5          ;GET CHAR TO R5
007676  005037  001174                      CLR     MODE            ;STD MODE
007702  004737  032226                      JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
007706  105277  171252                      INCB    @WORK2
007712  013701  010066                      MOV     TAB,R1
007716  000741                              BR      3$
                                                            ;....V....V....V....V....V....V
007720  012737  000003  010070      6$:     MOV     #3,COUNT
007726  117737  171232  010066      7$:     MOVB    @WORK2,TAB
007734  001430                              BEQ     11$
007736                                      SENDALL #MSG75
007736  012705  037154                      MOV     #MSG75,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
007742  005037  001174                      CLR     MODE
007746  004737  031700                      JSR     PC,SEND         ;NOW SEND THE MESSAGE
007752                              8$:     SENDALL #MSG65          ;ISSUE A TAB
007752  012705  037102                      MOV     #MSG65,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
```

```
                007756  005037  001174                          CLR     MODE
                007762  004737  031700                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
          45400 007766                                          SENDCH  #'I             ;PRINT AN ''I''
                007766  012705  000111                          MOV     #'I,R5          ;GET CHAR TO R5
                007772  005037  001174                          CLR     MODE            ;STD MODE
                007776  004737  032226                          JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
          45500 010002  005337  010066                          DEC     TAB
          45600 010006  001361                                  BNE     8$
          45700 010010  005337  010070              10$:        DEC     COUNT
          45800 010014  001344                                  BNE     7$
          45900 010016                              11$:        SENDALL #MSG77
                010016  012705  037157                          MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
                010022  005037  001174                          CLR     MODE
                010026  004737  031700                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
          46000 010032  005237  001164                          INC     WORK2
          46100 010036  023727  001164  010066                  CMP     WORK2,#TAB
          46200 010044  001236                                  BNE     2$
          46300 010046  000207                                  RTS     PC              ;EXIT
          46400
          46500
          46600 010050  000004              TABL13:     .WORD   4
          46700 010052  000010                          .WORD   8.
          46800 010054  000011                          .WORD   9.
          46900 010056  000020                          .WORD   16.
          47000 010060  000022                          .WORD   18.
          47100 010062  000040                          .WORD   32.
          47200 010064  000100                          .WORD   64.
          47300 010066  000000              TAB:        .WORD   0
          47400 010070  000002              COUNT:      .WORD   2
          47500
          47600
```

```
                                            ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                            ;MULTIPLE LINE FEED TEST
                                            ;       THIS TEST WILL PRINT A REFERENCE LINE OF DASHES
                                            ;       THEN SKIP N LINES AND PRINT THE NUMBER  OF LINES
                                            ;       SKIPPED, ALONG WITH SOME DASHES FOR VISUAL
                                            ;       REFERENCE. EACH SKIP COUNT N IS DONE TWICE FOR N
                                            ;       = 1 TO 7. AT 6 LINES PER INCH.
                                            ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;.

010072                                      TEST10: SENDALL #MSG123         ;SEND TEST ID
010072  012705  040141                              MOV     #MSG123,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
010076  005037  001174                              CLR     MODE
010102  004737  031700                              JSR     PC,SEND         ;NOW SEND THE MESSAGE
010106                                              SENDALL #MSG77          ;SKIP 3 LINES
010106  012705  037157                              MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
010112  005037  001174                              CLR     MODE
010116  004737  031700                              JSR     PC,SEND         ;NOW SEND THE MESSAGE
010122  012737  000001  001160                      MOV     #1,WORK
010130  012737  000012  001164                      MOV     #12,WORK2
010136                                              SENDALL #MSG124         ;SEND LINE OF DASHES
010136  012705  040176                              MOV     #MSG124,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
010142  005037  001174                              CLR     MODE
010146  004737  031700                              JSR     PC,SEND         ;NOW SEND THE MESSAGE
010152  023727  001160  000010              1$:     CMP     WORK,#10        ;ALL DONE ?
010160  001532                                      BEQ     4$              ;YES- JUMP
010162  013737  001160  001162                      MOV     WORK,WORK1
010170                                              SENDR   #WORK2,WORK1    ;SEND LINE FEEDS
010170  012705  001164                              MOV     #WORK2,R5
010174  113737  001162  001174                      MOVB    WORK1,MODE
010202  112737  000020  001175                      MOVB    #20,MODE+1
010210  004737  031700                              JSR     PC,SEND
010214  013700  001162                              MOV     WORK1,R0
010220  062700  041060                              ADD     #[illegible]160,R0  ;GET NUMERIC CHARACTER
010224  111037  001166                              MOVB    (R0),WORK3
010230                                              SENDC2  #'-,#6          ;SEND 6 DASHES
010230  012705  000055                              MOV     #'-,R5          ;GET CHAR TO R5
010234  012737  000006  001174                      MOV     #6,MODE         ;GET REPEAT COUNT
010242  112737  000020  001175                      MOVB    #20,MODE+1      ;SET REPEAT MODE
010250  004737  032226                              JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
010254                                              SENDCH  #'0             ;AND A ZERO
010254  012705  000060                              MOV     #'0,R5          ;GET CHAR TO R5
010260  005037  001174                              CLR     MODE            ;STD MODE
010264  004737  032226                              JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
010270                                              SENDCH  WORK3           ;AND THE NUMBER FROM ABOVE
010270  013705  001166                              MOV     WORK3,R5                ;GET CHAR TO R5
010274  005037  001174                              CLR     MODE            ;STD MODE
010300  004737  032226                              JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
010304                                              SENDALL #MSG66          ;NOW RETURN CHAR
010304  012705  037104                              MOV     #MSG66,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
010310  005037  001174                              CLR     MODE
010314  004737  031700                              JSR     PC,SEND         ;NOW SEND THE MFSSAGE
010320                                      3$:     SENDR   #WORK2,WORK1    ;SKIP A LINE
010320  012705  001164                              MOV     #WORK2,R5
010324  113737  001162  001174                      MOVB    WORK1,MODE
010332  112737  000020  001175                      MOVB    #20,MODE+1
010340  004737  031700                              JSR     PC,SEND
```

```
 50500 010344
       010344  012705  000055                    SENDC2  #'-,#6          ;SEND 6 DASHES
       010350  012737  000006  001174              MOV     #'-,R5          ;GET CHAR TO R5
       010356  112737  000020  001175              MOV     #6,MODE         ;GET REPEAT COUNT
       010364  004737  032226                      MOVB    #20,MODE+1      ;SET REPEAT MODE
 50600 010370                                      JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
       010370  012705  000060                      SENDCH  #'0
       010374  005037  001174                      MOV     #'0,R5          ;GET CHAR TO R5
       010400  004737  032226                      CLR     MODE            ;STD MODE
 50700 010404                                      JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
       010404  013705  001166                      SENDCH  WORK3
       010410  005037  001174                      MOV     WORK3,R5                ;GET CHAR TO R5
       010414  004737  032226                      CLR     MODE            ;STD MODE
 50800 010420                                      JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
       010420  012705  037104                      SENDALL #MSG66          ;SEND CR
       010424  005037  001174                      MOV     #MSG66,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       010430  004737  031700                      CLR     MODE
 50900 010434  005237  001160                      JSR     PC,SEND         ;NOW SEND THE MESSAGE
 51000 010440  004737  034166                      INC WORK                ;CHANGE NO OF LF'S
 51100 010444  000642                              JSR     PC,QUIET
 51200 010446                                      BR      1$
       010446  012705  037157              4$:     SENDALL #MSG77          ;SKIP 3 LINES
       010452  005037  001174                      MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       010456  004737  031700                      CLR     MODE
 51300 010462  000207                              JSR     PC,SEND         ;NOW SEND THE MESSAGE
 51400                                             RTS     PC
 51500
 51600
```

```
                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                        ; HORIZONTAL MOVEMENT TEST
                                        ;       X'S ARE PRINTED AT RANDOM COLUMN POSITIONS
                                        ;       UNTIL THE LINE IS FULL. CONTROLLED BY THE
                                        ;       'WIDTH'' AS DETERMINED AT STARTUP.
                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

010464                                  TEST11: SENDALL #MSG28          ;SEND TEST ID
010464  012705  035573                          MOV     #MSG28,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
010470  005037  001174                          CLR     MODE
010474  004737  031700                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
010500  012703  010756                          MOV     #COLTBL,R3      ;POINTER TO TABLE OF COLUMNS
010504  012737  000001  001160                  MOV     #1,WORK         ;PRESENT POSITION
010512  112337  001162                  1$:     MOVB    (R3)+,WORK1     ;DESTINATION POSITION
010516  001510                                  BEQ     9$              ;BR IF END OF TABLE
010520  123737  001162  001172                  CMPB    WORK1,WIDTH     ;IN RANGE OF PAPER ?
010526  101371                                  BHI     1$              ;NO GET NEW DEST.
010530  123737  001162  001160          2$:     CMPB    WORK1,WORK      ;IF DEST > POS THEN SPACE
010536  001462                                  BEQ     8$              ;IF DECT = POS THEN PRINT X
010540  101023                                  BHI     4$              ;IF DEST < POS THEN
010542  013737  001162  001164                  MOV     WORK1,WORK2     ;IF DEST < POS-12 DO CR FIRST
010550  162737  000012  001164                  SUB     #12,WORK2       ;THEN SPACES
010556  123737  001160  001164                  CMPB    WORK,WORK2
010564  103435                                  BLO     6$
010566                                          SENDALL #MSG08          ;ELSE BACKSPACE 1
010566  012705  034756                          MOV     #MSG08,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
010572  005037  001174                          CLR     MODE
010576  004737  031700                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
010602  005337  001160                          DEC     WORK            ;POS = POS-1
010606  000750                                  BR      2$

010610  013737  001162  001166          4$:     MOV     WORK1,WORK3     ;CALCULATE # OF SPACES
010616  163737  001160  001166                  SUB     WORK,WORK3      ;DEST - POSITION
010624                                          SENDC2  #40,WORK3       ;SEND SPACES
010624  012705  000040                          MOV     #40,R5          ;GET CHAR TO R5
010630  013737  001166  001174                  MOV     WORK3,MODE              ;GET REPEAT COUNT
010636  112737  000020  001175                  MOVB    #20,MODE+1      ;SET REPEAT MODE
010644  004737  032226                          JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
010650  013737  001162  001160                  MOV     WORK1,WORK      ;POS = DEST
010656  000412                                  BR      8$

010660                                  6$:     SENDALL #MSG09          ;SEND RETURN FIRST
010660  012705  034760                          MOV     #MSG09,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
010664  005037  001174                          CLR     MODE
010670  004737  031700                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
010674  012737  000001  001160                  MOV     #1,WORK         ;POS = 1
010702  000712                                  BR      2$

010704                                  8$:     SENDCH  #'H             ;PRINT AN H
010704  012705  000110                          MOV     #'H,R5          ;GET CHAR TO R5
010710  005037  001174                          CLR     MODE            ;STD MODE
010714  004737  032226                          JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
010720  004737  034166                          JSR     PC,QUIET
010724  005237  001160                          INC     WORK            ;NEW POSITION
010730  005037  001162                          CLR     WORK1
010734  000137  010512                          JMP     1$              ;GET NEW DEST COLMN
```

```
 55900 010740                                  9$:     SENDALL #MSG77          ;SKIP 3 LINES
       010740  012705  037157                         MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       010744  005037  001174                         CLR     MODE
       010750  004737  031700                         JSR     PC,SEND         ;NOW SEND THE MESSAGE
 56000 010754  000207                               RTS     PC
 56100
 56200
 56300         000012                          .RADIX 10
 56400 010756    035     134     050           COLTBL: .BYTE   29,92,40,128,62,102,110,24,22,9,89,74,126
       010761    200     076     146
       010764    156     030     026
       010767    011     131     112
       010772    176
 56500 010773    151     126     173                   .BYTE   105,86,123,119,129,107,132,91,82,1,101,37,97
       010776    167     201     153
       011001    204     133     122
       011004    001     145     045
       011007    141
 56600 011010    166     130     070                   .BYTE   118,88,56,96,76,38,21,81,32,94,60,17,61
       011013    140     114     046
       011016    025     121     040
       011021    136     074     021
       011024    075
 56700 011025    165     031     105                   .BYTE   117,25,69,114,65,30,98,90,125,12,120,10,70
       011030    162     101     036
       011033    142     132     175
       011036    014     170     012
       011041    106
 56800 011042    037     016     027                   .BYTE   31,14,23,121,6,35,2,13,8,63,67,106,122
       011045    171     006     043
       011050    002     015     010
       011053    077     103     152
       011056    172
 56900 011057    202     044     113                   .BYTE   130,36,75,18,99,16,42,113,5,49,112,33,15
       011062    022     143     020
       011065    052     161     005
       011070    061     160     041
       011073    017
 57000 011074    066     115     047                   .BYTE   54,77,39,73,87,95,115,108,41,124,48,19,4
       011077    111     127     137
       011102    163     154     051
       011105    174     060     023
       011110    004
 57100 011111    177     065     147                   .BYTE   127,53,103,52,93,85,83,50,43,116,59,57,7
       011114    064     135     125
       011117    123     062     053
       011122    164     073     071
       011125    007
 57200 011126    067     107     104                   .BYTE   55,71,68,3,111,100,45,78,11,131,28,84,72
       011131    003     157     144
       011134    055     116     013
       011137    203     034     124
       011142    110
 57300 011143    072     042     054                   .BYTE   58,34,44,47,27,20,79,109,66,64,104,80,26
       011146    057     033     024
       011151    117     155     102
       011154    100     150     120
```

```
        011157      032
 57400  011160      063     056     000                .BYTE   51,46,0
 57500                                          .EVEN
 57600          000010                          .RADIX 8
 57700
 57800
```

```
 58000
 58100                          ;.....................................................................
 58200                          ; BUFFER OVERRUN TEST
 58300                          ;       THIS TEST WILL FORCE THE TERMINAL TO TRANSMIT AN XOFF
 58400                          ;       BY JAMMING A SERIES OF TIME CONSUMEING MOVEMENT CHARS
 58500                          ;       INTO THE BUFFER , FOLLOWED BY ENOUGH CHARS TO FILL
 58600                          ;       THE BUFFER. WHEN THE TERMINAL HAS EMPTIED THE BUFFER
 58700                          ;       TO 10 CHARS IT SHOULD SEND AN XON.
 58800                          ;.....................................................................
 58900 011164                   TEST12: SENDALL #MSG37
       011164  012705  036126           MOV     #MSG37,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       011170  005037  001174           CLR     MODE
       011174  004737  031700           JSR     PC,SEND         ;NOW SEND THE MESSAGE
 59000 011200                           SENDALL #MSG61          ;CLEAR ALL TAB STOPS
       011200  012705  037070           MOV     #MSG61,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       011204  005037  001174           CLR     MODE
       011210  004737  031700           JSR     PC,SEND         ;NOW SEND THE MESSAGE
 59100 011214                           SENDALL #MSG38          ;SET TABS AT COL 1 & 132
       011214  012705  036157           MOV     #MSG38,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       011220  005037  001174           CLR     MODE
       011224  004737  031700           JSR     PC,SEND         ;NOW SEND THE MESSAGE
 59200 011230  013737  001152  001166   MOV     NUMLIN,WORK3
 59300 011236  006337  001166           ASL     WORK3
 59400 011242  062737  024546  001166   ADD     #STOP,WORK3
 59500 011250                           SENDALL #MSG41          ;STUFF THE BUFFER FULL
       011250  012705  036263           MOV     #MSG41,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       011254  005037  001174           CLR     MODE
       011260  004737  031700           JSR     PC,SEND         ;NOW SEND THE MESSAGE
 59600 011264                           STALL   #9000.          ;SHOULD GET XOFF FROM ALL
       011264  012705  021450           MOV     #9000.,R5               ;SETUP STALL TIME CONSTANT
       011270  004737  033614           JSR     PC,MSTALL
 59700 011274  005037  001160           CLR     WORK            ;CHECK ALL LINES FOR XOFF
 59800 011300  012700  024546   1$:     MOV     #STOP,R0
 59900 011304  063700  001160           ADD     WORK,R0
 60000 011310  020037  001166           CMP     R0,WORK3
 60100 011314  103034                   BHIS    5$
 60200 011316  105710                   TSTB    (R0)    ;BIT7 SET ?
 60300 011320  100006                   BPL     3$              ;NO- POSSABLE ERROR
 60400 011322  042710  000200           BIC     #BIT7,(R0)
 60500 011326  062737  000002  001160   2$:     ADD     #2,WORK         ;OK- CHECK NEXT LINE
 60600 011334  000761                   BR      1$
 60700 011336  012702  020626   3$:     MOV     #DZLINE,R2      ;IS LINE ACTIVE ?
 60800 011342  063702  001160           ADD     WORK,R2
 60900 011346  105712                   TSTB    (R2)
 61000 011350  100001                   BPL     4$              ;YES- REAL ERROR NO XOFF
 61100 011352  000765                   BR      2$              ;NO- CHECK NEXT LINE
 61200 011354  006237  001160   4$:     ASR     WORK            ;GET REAL LINE NO.
 61300 011360  013737  001160  001204   MOV     WORK,ONLINE
 61400 011366  012746  036225           MOV     #MSG40,-(SP)    ;MSG ADDR FOR ERROR REPORT
 61500 011372  004737  020346           JSR     PC,ERRORT       ;REPORT ERROR
 61600 011376  000000                   HALT                    ;IF BIT15 IS SET
 61700 011400  006337  001160           ASL     WORK            ;RESTORE POINTER
 61800 011404  000750                   BR      2$              ;CHECK NEXT LINE
 61900 011406                   5$:     STALL   #4000.          ;WAIT FOR TERMINALS TO CATCH UP
       011406  012705  007640           MOV     #4000.,R5               ;SETUP STALL TIME CONSTANT
       011412  004737  033614           JSR     PC,MSTALL
 62000 011416  000240                   NOP
```

```
 62100 011420  005037  001160                    CLR     WORK            ;CHECK ALL LINES FOR XON
 62200 011424  012700  024546          6$:       MOV     #STOP,R0
 62300 011430  063700  001160                    ADD     WORK,R0
 62400 011434  020037  001166                    CMP     R0,WORK3
 62500 011440  103037                            BHIS    15$
 62600 011442  032710  000001                    BIT     #BIT0,(R0)      ;HAS XON BEEN RECVD ?
 62700 011446  001406                            BEQ     8$              ;NO- POSSABLE ERROR
 62800 011450  042710  000001                    BIC     #BIT0,(R0)
 62900 011454  062737  000002  001160    7$:     ADD     #2,WORK         ;CHFCK NEXT LINE
 63000 011462  000760                            BR      6$
 63100 011464  012702  020626          8$:       MOV     #DZLINE,R2      ;IS LINE ACTIVE ?
 63200 011470  063702  001160                    ADD     WORK,R2
 63300 011474  105712                            TSTB    (R2)            ;TEST BIT 7
 63400 011476  100001                            BPL     9$              ;YES ERROR, NO XON
 63500 011500  000765                            BR      7$              ;NO CONTINUE
 63600 011502  006237  001160          9$:       ASR     WORK            ;GET REAL LINE NO.
 63700 011506  013737  001160  001204            MOV     WORK,ONLINE
 63800 011514  012746  036170                    MOV     #MSG39,-(SP)    ;MSG ADDRESS FOR ERROR REPORT
 63900 011520  004737  020346                    JSR     PC,ERRORT       ;REPORT ERROR NOW
 64000 011524  000000                            HALT                    ;IF BIT15 IS SET
 64100 011526  006337  001160                    ASL     WORK            ;RESTORE POINTER
 64200 011532  052712  000200                    BIS     #BIT7,(R2)      ;DESELECT LINE IT'S DEAD.
 64300 011536  000746                            BR      7$
 64400 011540                          15$:      SENDALL #MSG09          ;SEND <CR>
       011540  012705  034760                    MOV     #MSG09,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       011544  005037  001174                    CLR     MODE
       011550  004737  031700                    JSR     PC,SEND         ;NOW SEND THE MESSAGE
 64500 011554  005037  001160                    CLR     WORK
 64600 011560  012700  024546          16$:      MOV     #STOP,R0        ;CLEAR BITS 7 & 0 IN TABLE
 64700 011564  063700  001160                    ADD     WORK,R0
 64800 011570  020037  001166                    CMP     R0,WORK3
 64900 011574  103006                            BHIS    20$
 65000 011576  042710  000201                    BIC     #201,(R0)       ;CLEAR THE FLAG BITS
 65100 011602  062737  000002  001160            ADD     #2,WORK         ;DO NEXT LINE
 65200 011610  000763                            BR      16$
 65300 011612                          20$:      SENDALL #MSG61          ;CLEAR ALL TABS
       011612  012705  037070                    MOV     #MSG61,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       011616  005037  001174                    CLR     MODE
       011622  004737  031700                    JSR     PC,SEND         ;NOW SEND THE MESSAGE
 65400 011626  000207                            RTS     PC
```

```
                                         ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                         ;VERTICAL PITCH TEST
                                         ;SET UP FOR THIS TEST IS DOWN LINE LOADED FROM
                                         ;THE HOST. 6 LINES ARE PRINTED AT EACH OF THE FOLLOWING :
                                         ; 12,8,6,4,3, AND 2 LINES PER INCH.
                                         ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

011630                                   TEST13: SENDALL #MSG110        ;SEND TEST ID
011630  012705  037737                           MOV     #MSG110,R5     ;BUILD SEND CALL USING MESSAGE ADDRESS
011634  005037  001174                           CLR     MODE
011640  004737  031700                           JSR     PC,SEND        ;NOW SEND THE MESSAGE
011644                                           SENDALL #MSG77         ;SKIP 3 LINES
011644  012705  037157                           MOV     #MSG77,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
011650  005037  001174                           CLR     MODE
011654  004737  031700                           JSR     PC,SEND        ;NOW SEND THE MESSAGE
011660  005037  001160                           CLR     WORK
011664  023727  001160  000012           1$:     CMP     WORK,#12
011672  003111                                   BGT     4$
011674  005037  001164                           CLR     WORK2
011700  005037  012134                           CLR     T17A
011704  005037  012136                           CLR     T17B
011710  013737  001160  012134                   MOV     WORK,T17A
011716  013737  012'34  012136                   MOV     T17A,T17B      ;GET TABLE OFFSET
011724  062737  012154  012136                   ADD     #TABLVF,T17B
011732  062737  012140  012134                   ADD     #TABLV,T17A
011740                                           SENDALL @T1?3
011740  017705  000172                           MOV     @T17B,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
011744  005037  001174                           CLR     MODE
011750  004737  031700                           JSR     PC,SEND        ;NOW SEND THE MESSAGE
011754                                           STALL   #250
011754  012705  000250                           MOV     #250,R5        ;SETUP STALL TIME CONSTANT
011760  004737  033614                           JSR     PC,MSTALL
011764  023727  001164  000006           2$:     CMP     WORK2,#6
011772  001445                                   BEQ     3$
011774                                           SENDALL #MSG88         ;PRINT MESSAGE LINE
011774  012705  037463                           MOV     #MSG88,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
012000  005037  001174                           CLR     MODE
012004  004737  031700                           JSR     PC,SEND        ;NOW SEND THE MESSAGE
012010                                           SENDALL #MSG89
012010  012705  037513                           MOV     #MSG89,R5      ;BUILD SEND CALL USINC MESSAGE ADDRESS
012014  005037  001174                           CLR     MODE
012020  004737  031700                           JSR     PC,SEND        ;NOW SEND THE MESSAGE
012024                                           SENDALL #MSG93
012024  012705  037537                           MOV     #MSG93,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
012030  005037  001174                           CLR     MODE
012034  004737  031700                           JSR     PC,SEND        ;NOW SEND THE MESSAGE
012040                                           SENDALL @T17A
012040  017705  000070                           MOV     @T17A,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
012044  005037  001174                           CLR     MODE
012050  004737  031700                           JSR     PC,SEND        ;NOW SEND THE MESSAGE
012054                                           SENDALL #MSG98
012054  012705  037565                           MOV     #MSG98,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
012060  005037  001174                           CLR     MODE
012064  004737  031700                           JSR     PC,SEND        ;NOW SEND THE MESSAGE
012070                                           STALL   #200
012070  012705  000200                           MOV     #200,R5        ;ScTUP STALL TIME CONSTANT
012074  004737  033614                           JSR     PC,MSTALL
```

```
012100  005237  001164                      INC       WORK2
012104  000727                              BR        2$
012106  062737  000002  001160     3$:      ADD       #2,WORK
012114  000663                              BR        1$
012116                             4$:      SENDALL   #MSG77          ;SKIP 3 LINES
012116  012705  037157                      MOV       #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
012122  005037  001174                      CLR       MODE
012126  004737  031700                      JSR       PC,SEND         ;NOW SEND THE MESSAGE
012132  000207                              RTS       PC

012134  000000                     T17A:    .WORD     000000
012136  000000                     T17B:    .WORD     000000
012140  037520  037561  037555     TABLV:   .WORD     MSG90,MSG97,MSG96,MSG95,MSG94,MSG118
012146  037551  037545  040106
012154  037623  037635  037616     TABLVF:  .WORD     MSG104,MSG106,MSG103,MSG117,MSG105,MSG102
012162  040101  037630  037611



                                   ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                   ;PRINTER BELL TEST
                                   ;        THIS TEST WILL ISSUE 8 BELL CODES, WITH A DELAY
                                   ;        OF  .1 SEC BETWEEN EACH BELL.
                                   ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

012170                             TEST14:  SENDALL   #MSG120         ;SEND TEST ID
012170  012705  040112                      MOV       #MSG120,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
012174  005037  001174                      CLR       MODE
012200  004737  031700                      JSR       PC,SEND         ;NOW SEND THE MESSAGE
012204  012737  000010  001160              MOV       #10,WORK        ;8 BELL COUNT
012212  005037  001164                      CLR       WORK2
012216  112737  000007  001164              MOVB      #7,WORK2
012224                             1$:      SENDALL   #WORK2
012224  012705  001164                      MOV       #WORK2,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
012230  005037  001174                      CLR       MODE
012234  004737  031700                      JSR       PC,SEND         ;NOW SEND THE MESSAGE
012240                                      STALL     #100
012240  012705  000100                      MOV       #100,R5         ;SETUP STALL TIME CONSTANT
012244  004737  033614                      JSR       PC,MSTALL
012250  005337  001160                      DEC       WORK
012254  001363                              BNE       1$
012256  000207                              RTS       PC
```

```
                                           ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                           ;MAIN KEYBOARD TEST
                                           ;        THIS TEST WILL REQUIRE THE OPERATOR TO TYPE ALL
                                           ;        THE PRINTING KEYS ON THE KEYBOARD. IF ANY KEYS ARE
                                           ;        NOT SEEN BY THE PROGRAM THEY WILL BE REQUESTED
                                           ;        AGAIN, AND A THIRD TIME IF NECESSARY.
                                           ;        INSTRUCTIONS WILL BE TYPED TO PRESS THE SHIFTS
                                           ;        CAPS-LOC, ECS, AND FUNCTION KEYS.
                                           ;        FIVE SECONDS IS ALLOWED PER KEY .
                                           ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
012260  005037  001204                     TEST20: CLR     ONLINE          ;SET CURRENT LINE TO ZERO
012264  013737  001204  001160             1$:     MOV     ONLINE,WORK
012272  006337  001160                             ASL     WORK
012276  013702  001160                             MOV     WORK,R2
012302  023737  001204  001152                     CMP     ONLINE,NUMLIN   ;ALL DONE  ?
012310  103402                                     BLO     .+6
012312  000137  014370                             JMP     END22           ;YES EXIT
012316  105762  020626                             TSTB    DZLINE(R2)      ;IS THIS LINE SELECTED ?
012322  100003                                     BPL     2$              ;YES DO TEST
012324  005237  001204                             INC     ONLINE          ;NO GET NEXT LINE NO
012330  000755                                     BR      1$
012332                                     2$:     SENDI   #MSG164,ONLINE          ;SEND TEST ID
012332  012705  041130                             MOV     #MSG164,R5              ;MESSAGE ADDRESS TO R5
012336  112737  000010  001175                     MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
012344  113737  001204  001174                     MOVB    ONLINE,MODE             ;SELECTED LINE NO.
012352  004737  031700                             JSR     PC,SEND
012356  005037  014302                             CLR     FLAG21          ;CLEAR TEST FLAG BITS
012362                                             SENDI   #MSG140,ONLINE          ;PRINT INSTRUCTIONS
012362  012705  040226                             MOV     #MSG140,R5              ;MESSAGE ADDRESS TO R5
012366  112737  000010  001175                     MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
012374  113737  001204  001174                     MOVB    ONLINE,MODE             ;SELECTED LINE NO.
012402  004737  031700                             JSR     PC,SEND
012406  012737  012734  001140             3$:     MOV     #6$,HOOK        ;LINKAGE TO RECV ROUTINE
012414  042737  004000  014302                     BIC     #BIT11,FLAG21           ;RESET LEFTOVER FLAG
012422  004737  034166                             JSR     PC,QUIET
012426                                             STALL   #5000.          ;5 SECOND TIMEOUT
012426  012705  011610                             MOV     #5000.,R5               ;SETUP STALL TIME CONSTANT
012432  004737  033614                             JSR     PC,MSTALL
012436  032737  020000  014302                     BIT     #BIT13,FLAG21   ;CHAR IN SET ?
012444  001445                                     BEQ     4$
012446  012703  014140                             MOV     #KEYTBL,R3      ;POINT TO KEY TABLE
012452  020327  014300                     7$:     CMP     R3,#KEYEND      ;ALL DONE ?
012456  103405                                     BLO     8$              ;NO
012460  004737  013772                             JSR     PC,T21E         ;REPORT ERROR.....
012464  005237  001110                             INC     ERROR
012470  000746                                     BR      3$
012472  123713  001170                     8$:     CMPB    CHARIN,(R3)             ;COMPARE TO TABLE
012476  001403                                     BEQ     9$
012500  062703  000002                             ADD     #2,R3           ;POINT TO NEXT ENTRY
012504  000762                                     BR      7$              ;KEEP LOOKING
012506  052713  100000                     9$:     BIS     #BIT15,(R3)     ;SET CHAR IN FLAG
012512  113737  001170  001162                     MOVB    CHARIN,WORK1    ;ECHO THE CHARACTER
012520                                             SENDI   #WORK1,ONLINE
012520  012705  001162                             MOV     #WORK1,R5               ;MESSAGE ADDRESS TO R5
012524  112737  000010  001175                     MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
```

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      012532  113737  001204  001174            MOVB    ONLINE,MODE             ;SELECTED LINE NO.
      012540  004737  031700                    JSR     PC,SEND
10400 012544  032737  010000  014302            BIT     #BIT12,FLAG21   ;CHECK FOR DONE BIT
10500 012552  001715                            BEQ     3$
10600 012554  000137  013010                    JMP     11$             ;ELSE TIMEOUT ERROR
10700 012560  105737  014302            4$:     TSTB    FLAG21          ;FIRST TIMEOUT ?
10800 012564  100045                            BPL     5$              ;YES TRY AGAIN
10900 012566                                    SENDI   #MSG146,ONLINE          ;NO SPACE MSG.....
      012566  012705  040565                    MOV     #MSG146,R5              ;MESSAGE ADDRESS TO R5
      012572  112737  000010  001175            MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
      012600  113737  001204  001174            MOVB    ONLINE,MODE             ;SELECTED LINE NO.
      012606  004737  031700                    JSR     PC,SEND
11000 012612                                    SENDI   #MSG165,ONLINE
      012612  012705  041160                    MOV     #MSG165,R5              ;MESSAGE ADDRESS TO R5
      012616  112737  000010  001175            MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
      012624  113737  001204  001174            MOVB    ONLINE,MODE             ;SELECTED LINE NO.
      012632  004737  031700                    JSR     PC,SEND
11100 012636                                    SENDI   #MSG143,ONLINE
      012636  012705  040514                    MOV     #MSG143,R5              ;MESSAGE ADDRESS TO R5
      012642  112737  000010  001175            MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
      012650  113737  001204  001174            MOVB    ONLINE,MODE             ;SELECTED LINE NO.
      012656  004737  031700                    JSR     PC,SEND
11200 012662  042737  000200  014302            BIC     #BIT7,FLAG21
11300 012670  005237  001110                    INC     ERROR
11400 012674  000137  013374                    JMP     17$             ;GO TO SECTN-2
11500 012700                            5$:     SENDI   #MSG142,ONLINE          ;HIT SPACE MSG.....
      012700  012705  040452                    MOV     #MSG142,R5              ;MESSAGE ADDRESS TO R5
      012704  112737  000010  001175            MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
      012712  113737  001204  001174            MOVB    ONLINE,MODE             ;SELECTED LINE NO.
      012720  004737  031700                    JSR     PC,SEND
11600 012724  052737  000200  014302            BIS     #BIT7,FLAG21    ;SET 2ND TRY FLAG
11700 012732  000625                            BR      3$
11800
11900                                   ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
12000                                   ;  SCAN ROUTINE
12100
12200 012734  005037  001146            6$:     CLR     LOOPO           ;RESET TIMEOUT COUNT
12300 012740  005037  001162                    CLR     WORK1
12400 012744  042705  177600                    BIC     #177600,R5              ;CLEAR PARITY BIT
12500 012750  010537  001170                    MOV     R5,CHARIN
12600 012754  052737  020000  014302            BIS     #BIT13,FLAG21   ;SET CHAR IN FLAG
12700 012762  120527  000040                    CMPB    R5,#40          ;IS CHAR A SPACE ?
12800 012766  001403                            BEQ     111$
12900 012770  004737  033364            10$:    JSR     PC,KBOUT        ;REMOVE CHAR FROM BUFFER
13000 012774  000207                            RTS     PC
13100 012776  000240                    111$:   NOP
13200 013000  052737  010000  014302            BIS     #BIT12,FLAG21   ;SET DONE FLAG
13300 013006  000770                            BR      10$
13400
13500                                   ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
13600                                   ; LEFTOVERS SCAN ROUTINE
13700
13800 013010                            11$:    SENDI   #MSG75,ONLINE           ;CRLF
      013010  012705  037154                    MOV     #MSG75,R5               ;MESSAGE ADDRESS TO R5
      013014  112737  000010  001175            MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
      013022  113737  001204  001174            MOVB    ONLINE,MODE             ;SELECTED LINE NO.
      013030  004737  031700                    JSR     PC,SEND
```

```
13900 013034  012703  014140                    MOV     #KEYTBL,R3      ;POINT TO TABLE
14000 013040  042737  010000  014302            BIC     #BIT12,FLAG21
14100 013046  005037  001162                    CLR     WORK1
14200 013052  020327  014300            12$:    CMP     R3,#KEYEND      ;DONE YET ?
14300 013056  001431                           BEQ     13$             ;YES ..GO TO 13$
14400 013060  005723                           TST     (R3)+           ;CHECK CHAR IN FLAG(BIT 15)
14500 013062  100773                           BMI     12$
14600 013064  005037  001160                    CLR     WORK
14700 013070  052737  004000  014302            BIS     #BIT11,FLAG21   ;SET LEFTOVER KEY FLAG
14800 013076  005303                           DEC     R3
14900 013100  114337  041073                    MOVB    -(R3),MSG162    ;PUT CHAR IN MSG
15000 013104                                   SENDI   #MSG162,ONLINE          ;AND TYPE IT OUT
      013104  012705  041073                    MOV     #MSG162,R5              ;MESSAGE ADDRESS TO R5
      013110  112737  000010  001175            MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
      013116  113737  001204  001174            MOVB    ONLINE,MODE             ;SELECTED LINE NO.
      013124  004737  031700                    JSR     PC,SEND
15100 013130  004737  034166                    JSR     PC,QUIET
15200 013134  062703  000002                    ADD     #2,R3           ;GET NEXT TABLE ENTRY
15300 013140  000744                           BR      12$             ;KEEP SCANNING FOR LEFTOVERS
15400 013142  032737  004000  014302    13$:    BIT     #BIT11,FLAG21   ;ANY LEFTOVERS ?
15500 013150  001465                           BEQ     15$             ;NO GO CLEAN THE TABLE ETC.
15600 013152                                   SENDI   #MSG143,ONLINE          ;NOT SEEN MSG.....
      013152  012705  040514                    MOV     #MSG143,R5              ;MESSAGE ADDRESS TO R5
      013156  112737  000010  001175            MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
      013164  113737  001204  001174            MOVB    ONLINE,MODE             ;SELECTED LINE NO.
      013172  004737  031700                    JSR     PC,SEND
15700 013176  012703  014276                    MOV     #KEYEND-2,R3
15800 013202  042713  100000                    BIC     #BIT15,(R3)     ;RESET SPACE  IN FLAG
15900 013206  005237  014302                    INC     FLAG21          ;OPERATOR GETS THREE TRIES
16000 013212  013737  014302  001160            MOV     FLAG21,WORK
16100 013220  042737  177770  001160            BIC     #-8.,WORK
16200 013226  023727  001160  000003            CMP     WORK,#3
16300 013234  003026                           BGT     14$             ;3 STRIKES YOU'RE OUT !!!
16400 013236                                   SENDI   #MSG144,ONLINE          ;TRY AGAIN MSG.....
      013236  012705  040550                    MOV     #MSG144,R5              ;MESSAGE ADDRESS TO R5
      013242  112737  000010  001175            MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
      013250  113737  001204  001174            MOVB    ONLINE,MODE             ;SELECTED LINE NO.
      013256  004737  031700                    JSR     PC,SEND
16500 013262                                   SENDI   #MSG145,ONLINE  ;HIT SPACE LAST MSG.....
      013262  012705  040416                    MOV     #MSG145,R5              ;MESSAGE ADDRESS TO R5
      013266  112737  000010  001175            MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
      013274  113737  001204  001174            MOVB    ONLINE,MODE             ;SELECTED LINE NO.
      013302  004737  031700                    JSR     PC,SEND
16600 013306  000137  012406                    JMP     3$
16700                          ;.....
16800 013312  012746  040514    14$:    MOV     #MSG143,-(SP)           ;NEVER RECVD  ERROR MSG....
16900 013316  004737  020346                    JSR     PC,ERRORT
17000 013322  000000                           HALT
17100 013324  012703  014140    15$:    MOV     #KEYTBL,R3      ;CLEAN THE TABLE FLAGS
17200 013330  042723  100000    16$:    BIC     #BIT15,(R3)+
17300 013334  020327  014300                    CMP     R3,#KEYEND
17400 013340  103773                           BLO     16$
17500 013342  005037  014302                    CLR     FLAG21
17600 013346                                   SENDI   #MSG77,ONLINE           ;SKIP 3 LINES
      013346  012705  037157                    MOV     #MSG77,R5               ;MESSAGE ADDRESS TO R5
      013352  112737  000010  001175            MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
      013360  113737  001204  001174            MOVB    ONLINE,MODE             ;SELECTED LINE NO.
```

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        013366  004737  031700                  JSR     PC,SEND
        013372  000240                          NOP

                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                        ; SECTION - 2  SHIFT,CAPS-LOC, ESC, CTL.

        013374  012737  014304  001166  17$:    MOV     #CTLTBL,WORK3
        013402  012703  014312                  MOV     #SHITBL-2,R3
        013406  012704  014352                  MOV     #CODTBL,R4
        013412  012737  013740  001140          MOV     #22$,HOOK
        013420  005777  165542          18$:    TST     @WORK3          ;END OF CTLTBL  ?
        013424  001004                          BNE     19$
        013426  005237  001204                  INC     ONLINE          ;SELECT NEXT LINE
        013432  000137  012264                  JMP     1$              ;YES EXIT TEST
        013436  062703  000002          19$:    ADD     #2,R3
        013442  005713                          TST     (R3)    ;END OF SHITBL ?
        013444  001004                          BNE     20$
        013446  062737  000002  001166          ADD     #2,WORK3
        013454  000761                          BR      18$
        013456  042737  000200  014302  20$:    BIC     #BIT7,FLAG21            ;CLEAR DONE FLAG
        013464                                  SENDI   #MSG150,ONLINE                  ;SEND INSTRUNTIONS
        013464  012705  040641                  MOV     #MSG150,R5              ;MESSAGE ADDRESS TO R5
        013470  112737  000010  001175          MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
        013476  113737  001204  001174          MOVB    ONLINE,MODE             ;SELECTED LINE NO.
        013504  004737  031700                  JSR     PC,SEND
        013510                                  SENDI   @WORK3,ONLINE   ;SEND INSTRUCTION #2
        013510  017705  165452                  MOV     @WORK3,R5               ;MESSAGE ADDRESS TO R5
        013514  112737  000010  001175          MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
        013522  113737  001204  001174          MOVB    ONLINE,MODE             ;SELECTED LINE NO.
        013530  004737  031700                  JSR     PC,SEND
        013534                                  SENDI   (R3),ONLINE
        013534  011305                          MOV     (R3),R5         ;MESSAGE ADDRESS TO R5
        013536  112737  000010  001175          MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
        013544  113737  001204  001174          MOVB    ONLINE,MODE             ;SELECTED LINE NO.
        013552  004737  031700                  JSR     PC,SEND
        013556  004737  034166                  JSR     PC,QUIET
        013562                                  STALL   #5000.                  ;WAIT 5 SECONDS
        013562  012705  011610                  MOV     #5000.,R5               ;SETUP STALL TIME CONSTANT
        013566  004737  033614                  JSR     PC,MSTALL
        013572  105737  014302                  TSTB    FLAG21                  ;DONE FLAG SET  ?
        013576  100445                          BMI     21$                     ;YES  BRANCH
        013600                                  SENDI   #MSG146,ONLINE          ;ERROR DIDN'T RECV CHAR
        013600  012705  040565                  MOV     #MSG146,R5              ;MESSAGE ADDRESS TO R5
        013604  112737  000010  001175          MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
        013612  113737  001204  001174          MOVB    ONLINE,MODE             ;SELECTED LINE NO.
        013620  004737  031700                  JSR     PC,SEND
        013624  162703  000002                  SUB     #2,R3
        013630                                  SENDI   (R3)+,ONLINE
        013630  012305                          MOV     (R3)+,R5                ;MESSAGE ADDRESS TO R5
        013632  112737  000010  001175          MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
        013640  113737  001204  001174          MOVB    ONLINE,MODE             ;SELECTED LINE NO.
        013646  004737  031700                  JSR     PC,SEND
        013652                                  SENDI   #MSG143,ONLINE
        013652  012705  040514                  MOV     #MSG143,R5              ;MESSAGE ADDRESS TO R5
        013656  112737  000010  001175          MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
        013664  113737  001204  001174          MOVB    ONLINE,MODE             ;SELECTED LINE NO.
        013672  004737  031700                  JSR     PC,SEND
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013676  005237  001110                    INC     ERROR
013702  005737  001116                    TST     SO              ;HALT ON ERROR ?
013706  100253                            BPL     19$
013710  000000                            HALT                    ;IF BIT 15 SET
013712  000240                    21$:    NOP
013714  123724  001170                    CMPB    CHARIN,(R4)+    ;CHECK FOR CORRECT CODE
013720  001646                            BEQ     19$
013722  004737  013772                    JSR     PC,T21E         ;CALL ERROR ROUTINE
013726  005304                            DEC     R4
013730  162703  000002                    SUB     #2,R3
013734  000137  013436                    JMP     19$


                                  ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                  ; CODE CHECKER ROUTINE

013740  000240                    22$:    NOP                     ;GET CHAR FROM FIFO
013742  052737  000200  014302            BIS     #BIT7,FLAG21    ;SET DONE FLAG
013750  042705  177600                    BIC     #177600,R5              ;CLEAR PARITY BIT
013754  010537  001170                    MOV     R5,CHARIN
013760  005037  001146            23$:    CLR     LOOPO           ;TURN OFF TIMER
013764  004737  033364                    JSR     PC,KBOUT
013770  000207                            RTS     PC

                                  ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                  ;BAD CHAR CODE ROUTINE

013772  032737  020000  001116    T21E:   BIT     #BIT13,SO       ;CHECK SW 13
014000  001056                            BNE     26$
014002  013737  001170  001134            MOV     CHARIN,TEMP             ;SET UP CONVERTER
014010  012705  020574                    MOV     #EBUF,R5
014014  004737  033646                    JSR     PC,BIOCT        ;CONVERT TO ASCII
014020  113737  020577  040716            MOvB    EBUF+3,MSG149
014026  113737  020600  040717            MOVB    EBUF+4,MSG149+1.
014034  113737  020601  040720            MOVB    EBUF+5,MSG149+2.
014042                                    SENDI   #MSG146,ONLINE
014042  012705  040565                    MOV     #MSG146,R5              ;MESSAGE ADDRESS TO R5
014046  112737  000010  001175            MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
014054  113737  001204  001174            MOVB    ONLINE,MODE             ;SELECTED l INE NO.
014062  004737  031700                    JSR     PC,SEND
014066                                    SENDI   #MSG148,ONLINE
014066  012705  040600                    MOV     #MSG148,R5              ;MESSAGE ADDRESS TO R5
014072  112737  000010  001175            MOVB    #10,MODE+1      ;SET SINGLE _INE MODE
014100  113737  001204  001174            MOVB    ONLINE,MODE             ;SF!ECTED LINE NO.
014106  004737  031700                    JSR     PC,SEND
014112                                    SENDI   #MSG149,ONLINE
014112  012705  040716                    MOV     #MSG149,R5              ;MESSAGE ADDRESS TO R5
014116  112737  000010  001175            MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
014124  113737  001204  001174            MOVB    ONLINE,MODE             ;SELECTED LINE NO.
014132  004737  031700                    JSR     PC,SEND
014136  000207                    26$:    RTS     PC


014140  000054  000055  000056    KEYTBL: .WORD   54,55,56,57,60,61,62,63,64,73,47
014146  000057  000060  000061
014154  000062  000063  000064
014162  000073  000047
014166  000065  000066  000067            .WORD   65,66,67,70,71,75,133,134,135
```

```
                014174  000070  000071  000075
                014202  000133  000134  000135
 24900          014210  000140  000141  000142                  .WORD   140,141,142,143,144,145,146,147
                014216  000143  000144  000145
                014224  000146  000147
 25000          014230  000150  000151  000152                  .WORD   150,151,152,153,154,155,156,157
                014236  000153  000154  000155
                014244  000156  000157
 25100          014250  000160  000161  000162                  .WORD   160,161,162,163,164,165,166,167
                014256  000163  000164  000165
                014264  000166  000167
 25200          014270  000170  000171  000172                  .WORD   170,171,172,40
                014276  000040
 25300          014300  000000                        KEYEND:   .WORD   0
 25400          014302  000000                        FLAG21:   .WORD   0
 25500
 25600          014304  041232  040674  040776        CTLTBL:   .WORD   MSG170,MSG156,MSG157,0
                014312  000000
 25700
 25800          014314  040722  040652  041041        SHITBL:   .WORD   MSG151,MSG152,MSG158,MSG159,MSG154,MSG166
                014322  041047  040753  041166
 25900          014330  041202  041215  000000                  .WORD   MSG167,MSG168,000000,MSG169,MSG153,000000
                014336  041226  040747  000000
 26000          014344  041226  040747  000000                  .WORD   MSG169,MSG153,000000
 26100
 26200          014352     101     102     011        CODTBL:   .BYTE   101,102,011,015,020,010,012,177,104,044,104,064,0
                014355     015     020     010
                014360     012     177     104
                014363     044     104     064
                014366     000
 26300                                                 .EVEN
 26400
 26500          014370  005037  001146                END22:    CLR     LOOPO
 26600          014374  005037  001204                          CLR     ONLINE
 26700          014400  005037  014302                          CLR     FLAG21
 26800          014404  005037  001140                          CLR     HOOK
 26900          014410  000207                                  RTS     PC
 27000
```

```
27200                                    ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
27300                                    ; CHARACTER ' JE ECHO TEST 21
27400                                    ;       THIS TEST WILL ECHO THE OCTAL CODE OF THE CHARACTER
27500                                    ;       RECIEVED, ALONG WITH THE CHARACTER IF IT IS PRINTABLE.
27600                                    ;       IF NONPRINTABLE THE MNEMONIC WILL BE RETURNED.
27700                                    ;       TYPE A DELETE TO EXIT THIS TEST.
27800                                    ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
27900
28000 014412 005037 001204               TEST21: CLR ONLINE                  ;SU FOR LINE 0
28100 014416 005037 014302                       CLR FLAG21
28200 014422 013700 001204               1$:     MOV     ONLINE,R0
28300 014426 006300                              ASL     R0                  ;MAKE WORD OFFSET TO TABLES
28400 014430 023737 001204 001152                CMP     ONLINE,NUMLIN       ;DONE YET ?
28500 014436 103402                              BLO     4$
28600 014440 000137 015146                       JMP     20$
28700 014444 105760 020626               4$:     TSTB    DZLINE(R0)          ;IS LINE SELECTED ?
28800 014450 100003                              BPL     2$                  ;YES- GO TEST LINE
28900 014452 005237 001204                       INC     ONLINE              ;NO- TRY NEXT LINE
29000 014456 000761                              BR      1$
29100
29200 014460                             2$:     SENDI   #MSG18,ONLINE       ;SEND TEST ID MSG
      014460 012705 035310                       MOV     #MSG18,R5                   ;MESSAGE ADDRESS TO R5
      014464 112737 000010 001175                MOVB    #10,MODE+1          ;SET SINGLE LINE MODE
      014472 113737 001204 001174                MOVB    ONLINE,MODE                 ;SELECTED LINE NO.
      014500 004737 031700                       JSR     PC,SEND
29300 014504 012737 015164 001140                MOV     #30$,HOOK
29400 014512 004737 034166               3$:     JSR     PC,QUIET            ;WAIT FOR PRINTING TO FINISH
29500 014516                                     STALL   #10000              ;THEN WAIT 10 SECONDS
      014516 012705 010000                       MOV     #10000,R5                   ;SETUP STALL TIME CONSTANT
      014522 004737 033614                       JSR     PC,MSTALL
29600 014526 032737 000004 014302                BIT     #BIT2,FLAG21        ;CHAR RECVD FLAG SET ?
29700 014534 001013                              BNE     5$                  ;YES GOTO 5
29800 014536                                     SENDI   #MSGK3,ONLINE       ;NO- PROMPT OPERATOR
      014536 012705 042152                       MOV     #MSGK3,R5                   ;MESSAGE ADDRESS TO R5
      014542 112737 000010 001175                MOVB    #10,MODE+1          ;SET SINGLE LINE MODE
      014550 113737 001204 001174                MOVB    ONLINE,MODE                 ;SELECTED LINE NO.
      014556 004737 031700                       JSR     PC,SEND
29900 014562 000753                              BR      3$
30000
30100 014564 005037 014302               5$:     CLR     FLAG21
30200 014570 123727 001170 000177                CMPB    CHARIN,#177                 ;DELETE CHAR ?
30300 014576 001557                              BEQ     10$                 ;YES JUMP TO 10
30400 014600 005037 001160                       CLR     WORK
30500 014604 113737 001170 001160                MOVB    CHARIN,WORK                 ;SAVE CHAR
30600 014612 113737 001160 001134                MOVB    WORK,TEMP                   ;SU TO CONVERT TO OCTAL/ASCII
30700 014620 105037 001135                       CLRB    TEMP+1
30800 014624 012705 016320                       MOV     #T30BUF,R5
30900 014630 004737 033646                       JSR     PC,BIOCT            ;CONVERT & STORE AT T30BUF
31000 014634 113737 016323 040716                MOVB    T30BUF+3,MSG149
31100 014642 113737 016324 040717                MOVB    T30BUF+4,MSG149+1
31200 014650 113737 016325 040720                MOVB    T30BUF+5,MSG149+2
31300 014656                                     SENDI   #MSG149,ONLINE      ;SEND OCTAL DATA
      014656 012705 040716                       MOV     #MSG149,R5                  ;MESSAGE ADDRESS TO R5
      014662 112737 000010 001175                MOVB    #10,MODE+1          ;SET SINGLE LINE MODE
      014670 113737 001204 001174                MOVB    ONLINE,MODE                 ;SELECTED LINE NO.
      014676 004737 031700                       JSR     PC,SEND
31400 014702                                     SENDI   #MSG115,ONLINE      ;AND AN '='
```

```
                014702  012705  040043                  MOV     #MSG115,R5              ;MESSAGE ADDRESS TO R5
                014706  112737  000010  001175          MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
                014714  113737  001204  001174          MOVB    ONLINE,MODE             ;SELECTED LINE NO.
                014722  004737  031700                  JSR     PC,SEND
 31500          014726  004737  034166                  JSR     PC,QUIET
 31600          014732  123727  001160  000040        CMPB    WORK,#40        ;PRINTABLE CHARACTER ?
 31700          014740  101034                          BHI     7$              ;YES- GOTO 7
 31800
 31900          014742  012704  040716          6$:     MOV     #MSG149,R4
 32000          014746  005003                          CLR     R3
 32100          014750  113703  001160                  MOVB    WORK,R3
 32200          014754  006337  001160                  ASL     WORK
 32300          014760  063703  001160                  ADD     WORK,R3         ;CODE *3 FOR TABLE OFFSET
 32400          014764  116324  035747                  MOVB    MSG33(R3),(R4)+
 32500          014770  005203                          INC     R3
 32600          014772  116324  035747                  MOVB    MSG33(R3),(R4)+
 32700          014776  005203                          INC     R3
 32800          015000  116314  035747                  MOVB    MSG33(R3),(R4)  ;GET MNEMONIC CHARS
 32900          015004                                  SENDI   #MSG149,ONLINE          ;PRINT CHAR MNEMONIC
                015004  012705  040716                  MOV     #MSG149,R5              ;MESSAGE ADDRESS TO R5
                015010  112737  000010  001175          MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
                015016  113737  001204  001174          MOVB    ONLINE,MODE             ;SELECTED LINE NO.
                015024  004737  031700                  JSR     PC,SEND
 33000          015030  000415                          BR      8$
 33100
 33200          015032  113737  001170  037114  7$:     MOVB    CHARIN,MSG70    ;ECHO RECVD CHARACTER
 33300          015040                                  SENDI   #MSG70,ONLINE
                015040  012705  037114                  MOV     #MSG70,R5               ;MESSAGE ADDRESS TO R5
                015044  112737  000010  001175          MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
                015052  113737  001204  001174          MOVB    ONLINE,MODE             ;SELECTED LINE NO.
                015060  004737  031700                  JSR     PC,SEND
 33400          015064  032760  040000  031560  8$:     BIT     #BIT14,RECERR(R0)       ;PARITY OK ?
 33500          015072  001405                          BEQ     9$
 33600          015074  012746  035201                  MOV     #MSG15,-(SP)    ;NO CALL ERROR RTN.
 33700          015100  004737  020346                  JSR     PC,ERRORT
 33800          015104  000000                          HALT                            ;IF BIT 15 SET IN SWR
 33900          015106                          9$:     SENDI   #MSG75,ONLINE
                015106  012705  037154                  MOV     #MSG75,R5               ;MESSAGE ADDRESS TO R5
                015112  112737  000010  001175          MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
                015120  113737  001204  001174          MOVB    ONLINE,MODE             ;SELECTED LINE NO.
                015126  004737  031700                  JSR     PC,SEND
 34000          015132  000137  014512                  JMP     3$
 34200          015136  005237  001204  10$:     INC     ONLINE          ;TEST NEXT LINE
 34300          015142  000137  014422                  JMP     1$
 34400
 34500          015146                          20$:    SENDALL #MSG77
                015146  012705  037157                  MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
                015152  005037  001174                  CLR     MODE
                015156  004737  031700                  JSR     PC,SEND         ;NOW SEND THE MESSAGE
 34600          015162  000207                          RTS     PC
 34700
 34800          015164  005037  001146  30$:     CLR     LOOPO           ;ABORT TIMEOUT
 34900          015170  052737  000004  014302          BIS     #BIT2,FLAG21    ;SET CHAR RECVD FLAG
 35000          015176  042705  177600                  BIC     #177600,R5
 35100          015202  010537  001170                  MOV     R5,CHARIN
 35200          015206  004737  033364                  JSR     PC,KBOUT
 35300          015212  000207                          RTS     PC              ;TO RECV RTN.
```

```
                                            ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                            ; PITCH SETUP TEST
                                            ;       THIS TEST WILL REQUIRE THE OPERATOR TO ENTER
                                            ;       SETUP MODE, AND CHANGE THE MODE TO THAT SPECIFIED.
                                            ;       A LINE OR LINES OF DATA WILL BE PRINTED AND
                                            ;       SHOULD BE AT THE NEW PITCH.
                                            ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

015214  005037  001204                      TEST22: CLR     ONLINE                  ;START ON LINE 0
015220  012701  015622                              MOV     #TABL24,R1
015224  005037  001160                              CLR     WORK
015230  012737  015602  001140                      MOV     #11$,HOOK                         ;SET INTR CATCHER
015236  013700  001204                      1$:     MOV     ONLINE,R0
015242  006300                                      ASL     R0
015244  023737  001204  001152                      CMP     ONLINE,NUMLIN                     ;DONE ALL LINES ?
015252  001550                                      BEQ     10$                               ;YES JUMP
015254  105760  020626                              TSTB    DZLINE(R0)                        ;ACTIVE LINE ?
015260  100003                                      BPL     2$                                ;YES- START TESTS
015262  005237  001204                              INC     ONLINE                            ;NO- TRY NEXT LINE
015266  000763                                      BR      1$
015270                                      2$:     SENDI   #MSG320,ONLINE                    ;SEND TEST ID
015270  012705  041722                              MOV     #MSG320,R5                        ;MESSAGE ADDRESS TO R5
015274  112737  000010  001175                      MOVB    #10,MODE+1              ;SET SINGLE LINE MODE
015302  113737  001204  001174                      MOVB    ONLINE,MODE                       ;SELECTED LINE NO.
015310  004737  031700                              JSR     PC,SEND
015314  005037  001164                              CLR     WORK2                             ;SUBTEST 0 OF 9
015320  023727  001164  000012              3$:     CMP     WORK2,#10.                        ;DONE 10 YET?
015326  002403                                      BLT     4$                                ;NO KEEP TESTING
015330  005237  001204                              INC     ONLINE                            ;YES GET NEXT LINE
015334  000740                                      BR      1$
015336                                      4$:     SENDI   #MSG303,ONLINE                    ;SEND INSTRUCTIONS
015336  012705  041403                              MOV     #MSG303,R5                        ;MESSAGE ADDRESS TO R5
015342  112737  000010  001175                      MOVB    #10,MODE+1              ;SET SINGLE LINE MODE
015350  113737  001204  001174                      MOVB    ONLINE,MODE                       ;SELECTED LINE NO.
015356  004737  031700                              JSR     PC,SEND
015362  013701  001164                              MOV     WORK2,R1                          ;POINT TO MSG TABLE
015366  006301                                      ASL     R1
015370                                              SENDI   TABL24(R1),ONLINE                 ;SEND MSG FOR SUBTEST
015370  016105  015622                              MOV     TABL24(R1),R5                     ;MESSAGE ADDRESS TO R5
015374  112737  000010  001175                      MOVB    #10,MODE+1              ;SET SINGLE LINE MODE
015402  113737  001204  001174                      MOVB    ONLINE,MODE                       ;SELECTED LINE NO.
015410  004737  031700                              JSR     PC,SEND
015414                                              SENDI   #MSG304,ONLINE
015414  012705  041462                              MOV     #MSG304,R5                        ;MESSAGE ADDRESS TO R5
015420  112737  000010  001175                      MOVB    #10,MODE+1              ;SET SINGLE LINE MODE
015426  113737  001204  001174                      MOVB    ONLINE,MODE                       ;SELECTED LINE NO.
015434  004737  031700                              JSR     PC,SEND
015440  012737  177777  001136                      MOV     #-1,NOTYET              ;GETS CLEARED BY XON MSG
015446                                      5$:     STALL   #15000.                 ;ALLOW SETUP TIME 15 SEC
015446  012705  035230                              MOV     #15000.,R5                        ;SETUP STALL TIME CONSTANT
015452  004737  033614                              JSR     PC,MSTALL
015456  005737  001136                              TST     NOTYET                  ;SEEN XON YET ?
015462  001420                                      BEQ     7$                      ;YES CONTINUE
015464  105761  024546                              TSTB    STOP(R1)                ;LINE SELECTED ?
015470  100410                                      BMI     6$                      ;YES WAIT MORE TIME
015472  012746  036225                              MOV     #MSG40,-(SP)            ;REPORT ERROR
015476  004737  020346                              JSR     PC,ERRORT
```

```
                                                HAL             ;IF SW 15 SET
                                                INC     ONLINE  ;TRY NEXT LINE
                                                BR      1$
                                        6$:     NOP
                                                CLRB    STOP(R2)
                                                JMP     5$
                                        7$:     NOP
                                                TST     TAB24B(R1)
                                                BEQ     9$              ;YES    JUMP
                                                SENDI   TAB24B(R1),ONLINE       ;SEND THE MSG
                                                MOV     TAB24B(R1),R5           ;MESSAGE ADDRESS TO R5
                                                MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
                                                MOVB    ONLINE,MODE             ;SELECTED LINE NO.
                                                JSR     PC,SEND
                                                JSR     PC,QUIET
                                        9$:     INC     WORK2           ;SU NEXT SUBTEST
                                                JMP     3$
                                        10$:    CLR     HOOK            ;RELEASE INTR CATCHER
                                                RTS     PC              ;EXIT.......

                                        11$:    CMPB    #21,R5          ;XON ?
                                                BNE     12$
                                                CLR     NOTYET          ;CLEAR IN XON
                                                CLR     LOOPO           ;ABORT TIMEOUT
                                        12$:    RTS     PC

                                        TABL24: .WORD   MSG309,MSG310,MSG311,MSG312,MSG317,MSG314
                                                .WORD   MSG313,MSG308,MSG316,MSG315,000000

                                        TAB24B: .WORD   MSG107,MSG107,MSG107,MSG107,MSG321
                                                .WORD   MSG322,MSG323,MSG324,MSG325,MSG326,000000
```

```
                                  ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                  ; LIFE TEST  #5
                                  ;               THIS TEST WILL PRINT A CONTINUOUS PATTERN
                                  ;               OF ALL PRINTABLE CHARACTERS. EACH CHARACTER
                                  ;               WILL BE PRINTED ON 2 FULL LINES,
                                  ;               WITH THE PASS COUNT INBEDDED IN THE LINES.
                                  ;               THIS PATTERN WILL PRECESS 1 CHAR POSITION
                                  ;               EACH LINE PRINTED.
                                  ;               LOOPING IS CONTROLLED BY SWITCH #12.
                                  ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

015676                            TEST15: SENDALL #MSG270           ;SEND TEST ID
015676  012705  041313                    MOV     #MSG270,R5        ;BUILD SEND CALL USING MESSAGE ADDRESS
015702  005037  001174                    CLR     MODE
015706  004737  031700                    JSR     PC,SEND           ;NOW SEND THE MESSAGE
015712  032737  010000  001116            BIT     #BIT12,SO         ;IF LOOPING GO TO SECTION 4
015720  001021                            BNE     3$
015722                                    SENDC2  #'A,WIDTH         ;PRINT A FULL LINE OF A'S
015722  012705  000101                    MOV     #'A,R5            ;GET CHAR TO R5
015726  013737  001172  001174            MOV     WIDTH,MODE                 ;GET REPEAT COUNT
015734  112737  000020  001175            MOVB    #20,MODE+1        ;SET REPEAT MODE
015742  004737  032226                    JSR     PC,CHROUT         ;CALL CHAR OUTPUT ROUTINE
015746                            2$:     SENDALL #MSG77            ;SKIP 3 LINES
015746  012705  037157                    MOV     #MSG77,R5         ;BUILD SEND CALL USING MESSAGE ADDRESS
015752  005037  001174                    CLR     MODE
015756  004737  031700                    JSR     PC,SEND           ;NOW SEND THE MESSAGE
015762  000207                            RTS     PC                ;EXIT...............

015764  013737  001172  001160    3$:     MOV     WIDTH,WORK        ;GET WIDTH
015772  162737  000005  001160            SUB     #5,WORK           ;PRECESS LIMIT
016000  113737  001160  007512            MOVB    WORK,W1           ;SAVE IN W1
016006  012737  000041  001160            MOV     #41,WORK          ;PRINTING CHAR CODE
016014  112737  000002  007514            MOVB    #2,W2             ;SU 2 LINES PER CHAR
016022  005037  001162                    CLR     WORK1             ;CURRENT PRECESS COUNT
016026  004737  016264                    JSR     PC,GETPN          ;CONVERT PASSNO TO ASCII
016032  032737  010000  001116    4$:     BIT     #BIT12,SO         ;DO WHILE BIT 12 = 1
016040  001742                            BEQ     2$
016042  013737  001162  007516            MOV     WORK1,W3          ;GET PRECESS COUNT
016050  001412                            BEQ     6$
016052                                    SENDC2  WORK,W3           ;PRINT THE CHARACTER
016052  013705  001160                    MOV     WORK,R5           ;GET CHAR TO R5
016056  013737  007516  001174            MOV     W3,MODE           ;GET REPEAT COUNT
016064  112737  000020  001175            MOVB    #20,MODE+1        ;SET REPEAT MODE
016072  004737  032226                    JSR     PC,CHROUT         ;CALL CHAR OUTPUT ROUTINE
016076                            6$:     SENDALL #MSG271           ;PRINT THE PASS COUNT
016076  012705  041376                    MOV     #MSG271,R5        ;BUILD SEND CALL USING MESSAGE ADDRESS
016102  005037  001174                    CLR     MODE
016106  004737  031700                    JSR     PC,SEND           ;NOW SEND THE MESSAGE
016112  005003                            CLR     R3
016114  113737  007512  007516    MOVB    W1,W3             ;CHAR COUNT = WIDTH - 5 - PRECESS CNT
016122  163737  001162  007516            SUB     WORK1,W3
016130  001412                            BEQ     8$
016132                                    SENDC2  WORK,W3           ;PRINT CHARS TO END
016132  013705  001160                    MOV     WORK,R5           ;GET CHAR TO R5
016136  013737  007516  001174            MOV     W3,MODE           ;GET REPEAT COUNT
016144  112737  000020  001175            MOVB    #20,MODE+1        ;SET REPEAT MODE
016152  004737  032226                    JSR     PC,CHROUT         ;CALL CHAR OUTPUT ROUTINE
```

```
 63300 016156                                    8$:     SENDALL #MSG75          ;SEND CRLF
       016156  012705  037154                            MOV     #MSG75,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       016162  005037  001174                            CLR     MODE
       016166  004737  031700                            JSR     PC,SEND         ;NOW SEND THE MESSAGE
 63400 016172  005237  001162                            INC     WORK1           ;NEW PRECESS COUNT
 63500 016176  123737  001162  007512                    CMPB    WORK1,W1        ;RESET TO 0 IF MAX
 63600 016204  103402                                    BLO     9$
 63700 016206  005037  001162                            CLR     WORK1
 63800 016212  105337  007514                    9$:     DECB    W2              ;2 LINE DONE YET?
 63900 016216  001020                                    BNE     10$
 64000 016220  112737  000002  007514                    MOVB    #2,W2           ;YES RESET LINE COUNT
 64100 016226  005237  001160                            INC     WORK            ;GET NEXT CHAR CODE
 64200 016232  123727  001160  000177                    CMPB    WORK,#177       ;UNLESS ALL DONE
 64300 016240  001007                                    BNE     10$
 64400 016242  012737  000041  001160                    MOV     #41,WORK        ;THEN RESET CHAR CODE AND
 64500 016250  005237  001124                            INC     PASSNO          ;INC PASS COUNT
 64600 016254  004737  016264                            JSR     PC,GETPN        ;REFORMAT MSG
 64700 016260  000137  016032                    10$:    JMP     4$              ;GO CHECK SW 11
 64800
 64900
 65000 016264  013737  001124  001134            GETPN:  MOV     PASSNO,TEMP
 65100 016272  012705  016320                            MOV     #T30BUF,R5
 65200 016276  004737  033646                            JSR     PC,BIOCT        ;CONVERT TO ASCII
 65300 016302  113737  016324  041377                    MOVB    T30BUF+4,MSG271+1
 65400 016310  113737  016325  041400                    MOVB    T30BUF+5,MSG271+2
 65500 016316  000207                                    RTS     PC
 65501
 65502
 65503
 65504
 65505 016320                                    T30BUF: .BLKW   6
```

```
                                           ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                           ; PRINTER EXERCISOR
                                           ;       THIS TEST WILL PRINT A 10 BY 6 INCH MATRIX OF CHARACTERS
                                           ;       UTILIZING ALL POSSABLE COMBINATIONS OF PITCH SETTINGS.
                                           ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
016334                                     TEST16: SENDALL #MSG280          ;SEND TEST ID
016334  012705  041333                             MOV     #MSG280,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
016340  005037  001174                             CLR     MODE
016344  004737  031700                             JSR     PC,SEND          ;NOW SEND THE MESSAGE
016350  112703  000011                             MOVB    #9.,R3           ;IF 80 COL MAKE 6X8 MATRIX
016354  123727  001172  000120                     CMPB    WIDTH,#120
016362  101002                                     BHI     7$
016364  112703  000007                             MOVB    #7,R3
016370                                     7$:     SENDALL #MSG77           ;SKIP 3 LINES
016370  012705  037157                             MOV     #MSG77,R5        ;BUILD SEND CALL USING MESSAGE ADDRESS
016374  005037  001174                             CLR     MODE
016400  004737  031700                             JSR     PC,SEND          ;NOW SEND THE MESSAGE
016404                                             SENDALL #MSG104          ;SET H-PITCH TO 16.5
016404  012705  037623                             MOV     #MSG104,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
016410  005037  001174                             CLR     MODE
016414  004737  031700                             JSR     PC,SEND          ;NOW SEND THE MESSAGE
016420  005037  007512                             CLR     W1               ;DO 6 V PITCH GROUPS
016424  023727  007512  000005             1$:     CMP     W1,#5            ;IF W1 > 5 GOTO 50
016432  003402                                     BLE     2$
016434  000137  016776                             JMP     50$
016440  013700  007512                     2$:     MOV     W1,R0            ;GET V GROUP NO.
016444  006300                                     ASL     R0
016446  016001  012154                             MOV     TABLVF(R0),R1    ;POINT TO V PITCH SETUP
016452                                             SENDALL R1               ;SETUP V PITCH
016452  010105                                     MOV     R1,R5   ;BUILD SEND CALL USING MESSAGE ADDRESS
016454  005037  001174                             CLR     MODE
016460  004737  031700                             JSR     PC,SEND          ;NOW SEND THE MESSAGE
016464  016037  017150  007514                     MOV     TBL31E(R0),W2    ;GET LINE COUNT FOR THIS PITCH
016472  005737  007514                     3$:     TST     W2               ;IF ALL LINES DONE GOTO 40
016476  001002                                     BNE     4$
016500  000137  016766                             JMP     40$
016504  005037  007516                     4$:     CLR     W3               ;DO 10 H PITCH GROUPS PER LINE
016510  004737  034166                             JSR     PC,QUIET
016514                                             SENDALL #MSG75           ;SEND A  CRLF
016514  012705  037154                             MOV     #MSG75,R5        ;BUILD SEND CALL USING MESSAGE ADDRESS
016520  005037  001174                             CLR     MODE
016524  004737  031700                             JSR     PC,SEND          ;NOW SEND THE MESSAGE
016530  023703  007516                     5$:     CMP     W3,R3            ;IF 10 DONE GOTO 30
016534  003402                                     BLE     6$
016536  000137  016756                             JMP     30$
016542  013700  007516                     6$:     MOV     W3,R0            ;POINT TO H PITCH SETUP
016546  006300                                     ASL     R0
016550  016001  017114                             MOV     TBL31C(R0),R1    ;ADDRESS IN R1
016554                                             SENDALL R1               ;SETUP H PITCH
016554  010105                                     MOV     R1,R5   ;BUILD SEND CALL USING MESSAGE ADDRESS
016556  005037  001174                             CLR     MODE
016562  004737  031700                             JSR     PC,SEND          ;NOW SEND THE MESSAGE
016566  004737  034166                             JSR     PC,QUIET
016572  000240                                     NOP
016574  000240                                     NOP
```

```
 4300 016576  013700  007512                        MOV     W1,R0           ;GET ADDRESS OF CHARACTER
 4400 016602  006300                                ASL     R0
 4500 016604  010037  001166                        MOV     R0,WORK3
 4600 016610  006337  001166                        ASL     WORK3
 4700 016614  006337  001166                        ASL     WORK3
 4800 016620  063700  001166                        ADD     WORK3,R0                ;R0= W1*10.
 4900 016624  063700  007516                        ADD     W3,R0           ;R0= V ROW + COLM OFFSET
 5000 016630  116037  017020  001160                MOVB    TBL31A(R0),WORK ;PUT CHAR IN WORK
 5100 016636  013737  007516  001162                MOV     W3,WORK1        ;GET FORMAT SELECTOR
 5200 016644  006337  001162                        ASL     WORK1
 5300 016650  062737  017210  001162                ADD     #TBL31G,WORK1
 5400 016656  017700  162300                        MOV     @WORK1,R0       ;R0 HAS SELECTOR
 5500 016662  016001  017140                        MOV     TBL31D(R0),R1   ;R1 HAS OUTPUT MSG ADDRESS
 5600 016666  013737  007516  001162                MOV     W3,WORK1
 5700 016674  006337  001162                        ASL     WORK1           ;GET PRINT REPEAT COUNT
 5800 016700  062737  017164  001162                ADD     #TBL31F,WORK1
 5900 016706  017737  162250  001164                MOV     @WORK1,WORK2    ;WORK2 HAS REPEAT COUNT
 6000 016714  113711  001160                        MOVB    WORK,(R1)       ;PUT CHAR IN OUTPUT MSG
 6100 016720                                        SENDR   R1,WORK2                ;PRINT H GROUP OF CHARS
      016720  010105                                MOV     R1,R5
      016722  113737  001164  001174                MOVB    WORK2,MODE
      016730  112737  000020  001175                MOVB    #20,MODE+1
      016736  004737  031700                        JSR     PC,SEND
 6200 016742  004737  034166                        JSR     PC,QUIET
 6300 016746  005237  007516                        INC     W3              ;NEXT H GROUP
 6400 016752  000137  016530                        JMP     5$
 6500 016756  005337  007514              30$:      DEC     W2              ;ADJUST LINE COUNT -1
 6600 016762  000137  016472                        JMP     3$              ;DO NEXT LINE
 6700 016766  005237  007512              40$:      INC     W1              ;NEXT V GROUP
 6800 016772  000137  016424              41$:      JMP     1$              ;DO NEXT V GROUP
 6900 016776  004737  033000              50$:      JSR     PC,RESET0       ;RESET THE TERMINALS
 7000 017002                                        SENDALL #MSG77
      017002  012705  037157                        MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
      017006  005037  001174                        CLR     MODE
      017012  004737  031700                        JSR     PC,SEND         ;NOW SEND THE MESSAGE
 7100 017016  000207                                RTS     PC              ;ALL DONE...BYE
 7200
 7300
 7400
 7500
```

```
                                                ; TBL31A        6 GROUPS OF 10 CHARACTER CODES
                                                ; TBL31C        TABLE OF 10 H PITCH MESSAGE ADDRESSES
                                                ; TBL31D        TABLE OF 4 OUTPUT MESSAGE ADDRESSES
                                                ; TBL31E        TABLE OF 6 LINE COUNTS PER V PITCH
                                                ; TBL31F        TABLE OF 10 PRINT REPEAT COUNTS
                                                ; TBL31G        TABLE OF 10 SELECTORD TO TBL31D

 017020  052  141  142          TBL31A: .BYTE   52,141,142,143,144,145,146,53,101,102
 017023  143  144  145
 017026  146  053  101
 017031  102
 017032  147  150  151                  .BYTE   147,150,151,152,153,154,44,103,104,105
 017035  152  153  154
 017040  044  103  104
 017043  105
 017044  155  156  157                  .BYTE   155,156,157,160,161,100,106,107,110,111
 017047  160  161  100
 017052  106  107  110
 017055  111
 017056  162  163  164                  .BYTE   162,163,164,165,75,112,113,114,115,116
 017061  165  075  112
 017064  113  114  115
 017067  116
 017070  166  167  170                  .BYTE   166,167,170,45,117,120,121,122,123,124
 017073  045  117  120
 017076  121  122  123
 017101  124
 017102  171  172  043                  .BYTE   171,172,43,72,125,126,127,130,131,132
 017105  072  125  126
 017110  127  130  131
 017113  132

                                        .EVEN

 017114  037572  037577  037604  TBL31C: .WORD   MSG99,MSG100,MSG101,MSG108,MSG99
 017122  037677  037572
 017126  037577  037604  037677          .WORD   MSG100,MSG101,MSG108,MSG101,MSG101
 017134  037604  037604

 017140  041374  037114  037117  TBL31D: .WORD   MSG281,MSG70,MSG71,MSG72
 017146  037123

 017150  000014  000010  000006  TBL31E: .WORD   12.,8.,6,4,3,2
 017156  000004  000003  000002

 017164  000020  000014  000014  TBL31F: .WORD   16.,12.,12.,10.,8.,6,6,5,4,4
 017172  000012  000010  000006
 017200  000006  000005  000004
 017206  000004

 017210  000000  000000  000000  TBL31G: .WORD   0,0,0,0,2,2,2,2,4,6
 017216  000000  000002  000002
 017224  000002  000002  000004
 017232  000006
```

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                                            .SBTTL  CONSOLE DRIVER ROUTINES

                                            ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                            ; CONSOLE RECV INTERRUPT HANDLER

017234  105737  177560                      TTYIN:  TSTB    @#177560         ;READY ?
017240  100402                                      BMI     1$
017242  000137  017372                              JMP     211$             ;FALSE INTERRUPT
017246  113777  177562  161732              1$:     MOVB    @#177562,@PNTR   ;READ CHAR INTO BUFFER
017254  142777  000200  161724                      BICB    #200,@PNTR       ;STRIP PARITY BIT
017262  122777  000033  161716                      CMPB    #33,@PNTR        ;DECODE INPUT IF ESCAPE
017270  001002                                      BNE     111$
017272  000137  020144                              JMP     18$
017276  105737  177564                      111$:   TSTB    @#177564         ;ECHO THE CHAR
017302  100375                                      BPL     111$
017304  117737  161676  177566                      MOVB    @PNTR,@#177566
017312  122777  000003  161666                      CMPB    #03,@PNTR        ;CTL-C ?
017320  001010                                      BNE     113$
017322                                              SENDC   #MSGK1           ;SEND READY
017322  012705  042113                              MOV     #MSGK1,R5                ;GET MESSAGE ADDRESS
017326  004737  020304                              JSR     PC,CSEND         ;SEND MESSAGE
017332  012716  002336                              MOV     #WSEQ,(SP)       ;RETURN TO WAIT STATE
017336  000137  017372                              JMP     211$
017342  122777  000015  161636              113$:   CMPB    #15,@PNTR        ;DECODE INPUT IF  CR
017350  001006                                      BNE     2$
017352                                              SENDC   #MSG75           ;ECHO CRLF
017352  012705  037154                              MOV     #MSG75,R5                ;GET MESSAGE ADDRESS
017356  004737  020304                              JSR     PC,CSEND         ;SEND MESSAGE
017362  000137  017402                              JMP     3$
017366  005237  001206                      2$:     INC     PNTR             ;GET NEXT BUFFER SPACE
017372  012737  000101  177560              211$:   MOV     #101,@#177560    ;TURN CONSOLE ON AGAIN
017400  000002                                      RTI                      ;RETURN
017402  012737  020326  001206              3$:     MOV     #TKBUF,PNTR
017410  127727  161572  000071              4$:     CMPB    @PNTR,#71
017416  002403                                      BLT     5$
017420  142777  000040  161560                      BICB    #40,@PNTR        ;RESET LC BIT IF ALFA
017426  127727  161554  000015              5$:     CMPB    @PNTR,#15        ;STOP DECODE IF CR
017434  001005                                      BNE     6$
017436  012737  020326  001206                      MOV     #TKBUF,PNTR      ;RESET BUFFER POINTER FIRST
017444  000137  017372                              JMP     211$
017450  122777  000110  161530              6$:     CMPB    #'H,@PNTR        ;HALT COMMAND?
017456  001012                                      BNE     7$
017460  052737  100000  001116                      BIS     #BIT15,SO        ;YES- SET BIT 15
017466  052737  100000  001210                      BIS     #BIT15,TMPTST
017474  005237  001206                              INC     PNTR
017500  000137  017410                              JMP     4$
017504  122777  000114  161474              7$:     CMPB    #'L,@PNTR        ;LOOP COMMAND ?
017512  001012                                      BNE     8$
017514  052737  040000  001116                      BIS     #BIT14,SO        ;YES- SET BIT 14
017522  052737  040000  001210                      BIS     #BIT14,TMPTST
017530  005237  001206                              INC     PNTR
017534  000137  017410                              JMP     4$
017540  122777  000103  161440              8$:     CMPB    #'C,@PNTR        ;CLEAR COMMAND ?
017546  001012                                      BNE     9$
017550  042737  140400  001116                      BIC     #140400,SO       ;RESET THE BITS
017556  042737  140400  001210                      BIC     #140400,TMPTST
017564  005237  001206                              INC     PNTR
```

```
 5400 017570  000137  017410                        JMP     4$
 5500 017574  122777  000127  161404        9$:     CMPB    #'W,@PNTR       ;SET WIDTH ?
 5600 017602  001035                                BNE     10$
 5700 017604  010046                                MOV     R0,-(SP)        ;SAVE R0
 5800 017606  005000                                CLR     R0
 5900 017610  004737  020054                        JSR     PC,15$  ;CONVER NEXT CHARS TO OCTAL
 6000 017614  010037  001172                        MOV     R0,WIDTH        ,SET NEW WIDTH LIMIT
 6100 017620  012600                                MOV     (SP)+,R0
 6200 017622  005737  001172                        TST     WIDTH
 6300 017626  001003                                BNE     25$
 6400 017630  012737  000204  001172                MOV     #204,WIDTH
 6500 017636  023727  001172  000204        25$:    CMP     WIDTH,#204
 6600 017644  003403                                BLE     26$
 6700 017646  012737  000204  001172                MOV     #204,WIDTH
 6800 017654  023727  001172  000040        26$:    CMP     WIDTH,#32.
 6900 017662  002003                                BGE     27$
 7000 017664  012737  000040  001172                MOV     #32.,WIDTH
 7100 017672  000137  017410                27$:    JMP     4$
 7200 017676  122777  000122  161302        10$:    CMPB    #'R,@PNTR       ;RUN TEST COMMAND ?
 7300 017704  001014                                BNE     11$
 7400 017706  052737  010000  001210                BIS     #BIT12,TMPTST           ;SET THE CNTL BITS
 7500 017714  010046                                MOV     R0,-(SP)
 7600 017716  005000                                CLR     R0
 7700 017720  004737  020054                        JSR     PC,15$          ;CONVERT NEXT TO OCTAL
 7800 017724  004737  020230                        JSR     PC,NUMCHK
 7900 017730  012600                                MOV     (SP)+,R0
 8000 017732  000137  017410                        JMP     4$
 8100 017736  122777  000123  161242        11$:    CMPB    #'S,@PNTR       ;SEQUENCE COMMAND ?
 8200 017744  001014                                BNE     12$
 8300 017746  042737  012000  001210                BIC     #012000,TMPTST
 8400 017754  010046                                MOV     R0,-(SP)
 8500 017756  005000                                CLR     R0
 8600 017760  004737  020054                        JSR     PC,15$          ;CONVERT NEXT TO OCTAL
 8700 017764  004737  020230                        JSR     PC,NUMCHK
 8800 017770  012600                                MOV     (SP)+,R0
 8900 017772  000137  017410                        JMP     4$
 9000 017776  122777  000056  161202        12$:    CMPB    #'.,@PNTR       ;TERMINATOR ?
 9100 020004  001012                                BNE     14$
 9200 020006  052737  000400  001116                BIS     #BIT8,S0
 9300 020014  052737  000400  001210                BIS     #BIT8,TMPTST
 9400 020022  005237  001206                131$:   INC     PNTR
 9500 020026  000137  017410                        JMP     4$
 9600 020032                                14$:    SENDC   #MSGK3          ;UNDEFINED COMMAND CHAR
      020032  012705  042152                        MOV     #MSGK3,R5               ;GET MESSAGE ADDRESS
      020036  004737  020304                        JSR     PC,CSEND        ;SEND MESSAGE
 9700 020042  012737  020326  001206        141$:   MOV     #TKBUF,PNTR
 9800 020050  000137  017372                        JMP     211$
 9900
10000
10100 020054  005237  001206                15$:    INC     PNTR            ;POINT TO NEXT CHAR IN BUFFER
10200 020060  127727  161122  000060                CMPB    @PNTR,#60       ;EXIT IF NOT NUMERIC
10300 020066  002425                                BLT     16$
10400 020070  127727  161112  000071                CMPB    @PNTR,#71
10500 020076  003021                                BGT     16$
10600 020100  127727  161102  000070                CMPB    @PNTR,#70       ;DECIMAL OR OCTAL ?
10700 020106  002404                                BLT     17$
10800 020110  112700  000077                        MOVB    #77,R0          ;DECIMAL ; INVALID
```

```
020114  000137  020142                 JMP     16$
020120  142777  000370  161060  17$:   BICB    #370,@PNTR        ;STRIP AWAY ASCII BITS
020126  006300                         ASL     R0
020130  006300                         ASL     R0
020132  006300                         ASL     R0                ;MAKE ROOM FOR NEW DIGIT
020134  157700  161046                 BISB    @PNTR,R0          ;ADD NEW LSD
020140  000745                         BR      15$               ;GET NEXT CHAR
020142  000207                  16$:   RTS     PC                ;EXIT OCTAL IN R0

020144                          18$:   SENDC   #MSG22            ;ECHO $ AND CRLF
020144  012705  035443                 MOV     #MSG22,R5                  ;GET MESSAGE ADDRESS
020150  004737  020304                 JSR     PC,CSEND          ;SEND MESSAGE
020154  013737  001210  001116         MOV     TMPTST,S0         ;PUT TEST NO IN S0
020162  062706  000002                 ADD     #2,SP             ;FIX RETURN PC
020166  012746  002450                 MOV     #LSEQ,-(SP)       ;TO TEST SEQUENCER
020172  012737  020326  001206         MOV     #TKBUF,PNTR       ;RESTORE BUFFER POINTER
020200                                 SENDC   #MSGK1            ;SEND 'READY'
020200  012705  042113                 MOV     #MSGK1,R5                  ;GET MESSAGE ADDRESS
020204  004737  020304                 JSR     PC,CSEND          ;SEND MESSAGE
020210  012737  000101  177560         MOV     #101,@#177560     ;ENABLE CONSOLE
020216                                 STALL   #100
020216  012705  000100                 MOV     #100,R5           ;SETUP STALL TIME CONSTANT
020222  004737  033614                 JSR     PC,MSTALL
020226  000002                         RTI                       ;TO TEST SEQUENCER

020230  105700                  NUMCHK: TSTB   R0                ;TEST NO. ENTERED ?
020232  001006                         BNE     3$
020234  105037  001210                 CLRB    TMPTST
020240  042737  002000  001210  1$:    BIC     #BIT10,TMPTST     ;NO SELECT
020246  000207                  2$:    RTS     PC                ;BYE
020250  120027  000022          3$:    CMPB    R0,#22            ;TOO BIG ?
020254  003006                         BGT     4$                ;YES
020256  052737  002000  001210         BIS     #BIT10,TMPTST     ;OK SELECT TEST
020264  110037  001210                 MOVB    R0,TMPTST         ;SAVE TEST NO.
020270  000766                         BR      2$
020272                          4$:    SENDC   #MSGK3            ;? ? ? ?
020272  012705  042152                 MOV     #MSGK3,R5                  ;GET MESSAGE ADDRESS
020276  004737  020304                 JSR     PC,CSEND          ;SEND MESSAGE
020302  000756                         BR      1$




                                ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                ; CONSOLE TRANSMIT ROUTINE

020304  105715                  CSEND:  TSTB   (R5)              ;NULL ?
020306  001406                         BEQ     2$                ;YES- ALL DONE
020310  105737  177564          1$:    TSTB    @#177564          ;WAIT FOR READY BIT
020314  100375                         BPL     1$
020316  112537  177566                 MOVB    (R5)+,@#177566    ;SEND CHARACTER
020322  000770                         BR      CSEND
020324  000207                  2$:    RTS     PC

020326                          TKBUF:  .BLKW  10       ;CONSOLE INPUT BUFFER AREA


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```
                                        .SBTTL  ERROR HANDLER
                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                        ; ERRORT
                                        ;       THIS ROUTINE WILL HANDLE THE PRINTING OF
                                        ;       ERROR MESSAGES, UPDATE ERROR COUNTS, AND
                                        ;       CHECK ON SWITCH 13.
                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

020346  032737  020000  001116          ERRORT: BIT     #BIT13,SO                       ;INHIBIT PRINT ?
020354  001073                                  BNE     1$                              ;YES JUMP
020356  013737  001204  001134                  MOV     ONLINE,TEMP                     ;CONVERT LINE NO. TO ASCII
020364  012705  020574                          MOV     #EBUF,R5
020370  004737  033646                          JSR     PC,BIOCT                        ;CALL CONVERTER
020374  113737  020600  020622                  MOVB    EBUF+4,MSGE+14.                 ;FORMAT ERROR MSG
020402  113737  020601  020623                  MOVB    EBUF+5,MSGE+15.
020410  013737  001212  001134                  MOV     TSTTYP,TEMP                     ;GET TEST NO.
020416  042737  177700  001134                  BIC     #177700,TEMP
020424  012705  020574                          MOV     #EBUF,R5                        ;CONVERT IT TO ASCII
020430  004737  033646                          JSR     PC,BIOCT
020434  113737  020600  020611                  MOVB    EBUF+4,MSGE+5                   ;FORMAT ERROR MSG
020442  113737  020601  020612                  MOVB    EBUF+5,MSGE+6
020450                                          SENDI   #MSGE,ONLINE                    ;TEST AND LINE NO'S
020450  012705  020604                          MOV     #MSGE,R5                        ;MESSAGE ADDRESS TO R5
020454  112737  000010  001175                  MOVB    #10,MODE+1              ;SET SINGLE LINE MODE
020462  113737  001204  001174                  MOVB    ONLINE,MODE                     ;SELECTED LINE NO.
020470  004737  031700                          JSR     PC,SEND
020474  010346                                  MOV     R3,-(SP)                        ;SAVE R3
020476  016603  000004                          MOV     4(SP),R3                        ;GET MSG ADDRESS FROM STACK
020502                                          SENDI   R3,ONLINE                       ;SEND ERROR MSG
020502  010305                                  MOV     R3,R5                   ;MESSAGE ADDRESS TO R5
020504  112737  000010  001175                  MOVB    #10,MODE+1              ;SET SINGLE LINE MODE
020512  113737  001204  001174                  MOVB    ONLINE,MODE                     ;SELECTED LINE NO.
020520  004737  031700                          JSR     PC,SEND
020524                                          SENDC   #MSGE                           ;SAME THING TO CONSOLE
020524  012705  020604                          MOV     #MSGE,R5                        ;GET MESSAGE ADDRESS
020530  004737  020304                          JSR     PC,CSEND                ;SEND MESSAGE
020534                                          SENDC   R3
020534  010305                                  MOV     R3,R5                   ;GET MESSAGE ADDRESS
020536  004737  020304                          JSR     PC,CSEND                ;SEND MESSAGE
020542  012603                                  MOV     (SP)+,R3                        ;RESTORE R3
020544  011666  000002                  1$:     MOV     (SP),2(SP)                      ;ERASE ADDR FROM STACK
020550  062706  000002                          ADD     #2,SP                           ;ADJUST STACK POINTER
020554  005237  001110                          INC     ERROR                           ;FLAG THE ERROR
020560  005737  001116                          TST     SO                              ;HALT ON ERROR SET ?
020564  100402                                  BMI     2$
020566  062716  000002                          ADD     #2,(SP)                 ;JUMP OVER ERROR HALT
020572  000207                          2$:     RTS     PC                              ;RETURN


020574  000000  000000  000000          EBUF:   .WORD   0,0,0,0                 ;BUFFER AREA
020602  000000
020604     124     105     123          MSGE:   .ASCIZ  /TEST 00, LINE 00 /             ;STD MSG HEADER
020607     124     040     060
020612     060     054     040
020615     114     111     116
020620     105     040     060
020623     060     040     000
```

```
19700                                           .EVEN
19800
```

```
                                .SBTTL   DZ11 DRIVER ROUTINES
                                ;THSES ROUTINES WILL HANDLE FROM 1 TO 8 DZ11'S
                                ;JOHN COMEAU INVENTED THESE WONDERFULL ROUTINES


                                ;NOW A BUNCH OF TABLES

                                ;HERE IS A ONE WORD PER LINE TABLE. IT HOLDS LINE PARAMETERS

                                ;THE PROGRAM IS RESPONSIBLE FOR SETTING IT UP.
                                ;THE DZ11 ROUTINES SIMPLY READ IT.
                                ;
                                ;BIT 7 IN EACH BYTE, IS THE INACTIVE BIT. IF SET, THE LINE
                                ;WILL BE IGNORED BY THE DRIVER ROUTINES

                                ;BITS 3-0  HOLD THE LINES BAUD RATE INFO
                                ;                       BITS 3-0/BAUD
                                ;                         0000    50
                                ;                         0001    75
                                ;                         0010    110
                                ;                         0011    134.5
                                ;                         0100    150
                                ;                         0101    300
                                ;                         0110    600
                                ;                         0111    1200
                                ;                         1000    1800
                                ;                         1001    2000
                                ;                         1010    2400
                                ;                         1011    3600
                                ;                         1100    4800
                                ;                         1101    7200
                                ;                         1110    9600
                                ;                         1111    RESERVED
                                ;BIT 6 SELECTS THE TYPE OF PARITY,  0= EVEN  1-ODD
                                ;BIT 5 IT THE PARITY ENABLING BIT, 0 IF NO PARITY, 1 IF PARITY
                                ;
020626                          DZLINE: .BLKW   DZCON*8.                ; NO. OF DZ'S TIMES 8 LINES PER DZ=# WORDS


                                ;HERE ARE THE DZ11 COMMAND BUFFER AREAS
                                ;THERE IS ONE FOR EACH LINE.
                                ;EACH OF 20 WORDS LONG
                                ;THE COMMAND FORMAT IS AS FOLLOWS.
                                ;1ST WORD IS THE ADDRESS OF THE MESSAGE BEING TYPED
                                ;THE 2ND WORD. IF 0, STANDARD MEGSSAGE
                                ;IF HIGH BYTE IS 10, LOW BYTE HOLDS LINE NO TO SEND TO
                                ;IF HIGH BYTE IS 20 LOW BYTE HOLDS REPEAT COUNT
                                ;IF HIGH BYTE IS 30 LOW BYTE HOLDS SPECIAL TERMINATOR.
020746                          DZCOMB: .BLKW   DZCON*8.*20.            ; 8 LINES PER DZ TIMES 20. WORDS PER LINE TI
```

```
 5700                                   ;TABLE OF FLAGS FOR ACTIVE LINES
 5800 024046                            ACTIVE: .BLKW   DZCON*8.
 5900
 6000
 6100                                   ;HERE IS THE TABLE OF CURRENT REPEAT COUNTS.
 6200 024166                            CURREP: .BLKW   DZCON*8.
 6300
 6400                                   ;HERE IF THE TABLE OF CURRENT TERMINATORS
 6500 024306                            CURTER: .BLKW   DZCON*8.
 6600
 6700                                   ;HERE IS THE LINE REPLY TABLE
 6800 024426                            REPTBL: .BLKW   DZCON*8.
 6900
 7000                                   ;HERE IS A TABLE OF SWITCH WORDS SET TO CLEAR TCR REG
 7100 024546                            STOP:   .BLKW   DZCON*8.
 7200
 7300                                   ;HERE IS THE TABLE OF CURRENT TEXT ADDRESSES
 7400 024666                            CURADD: .BLKW   DZCON*8.
 7500
 7600                                   ;HERE ARE THE PRINTING COMMAND BUFFER POINTERS
 7700 025006                            COMCNT: .BLKW   DZCON*8.
 7800 025126                            COMIN:  .BLKW   DZCON*8.
 7900 025246                            COMOUT: .BLKW   DZCON*8.
 8000 025366                            COMEND: .BLKW   DZCON*8.
 8100
 8200 025506                            TCRBIT: .BLKW   DZCON*8.        ;LINE1-1, LINE2=2, LINE3=4, LINE4=10
 8300
 8400                                   ;CHAR COUNT
 8500 025626                            KBCNT:  .BLKW   DZCON*8.
 8600
 8700                                   ;END OF BUFFER TABLE
 8800 025746                            KBBUFE: .BLKW   DZCON*8.
 8900
 9000                                   ;BEGIN OF BUFFER TABLE
 9100 026066                            KBBUFB: .BLKW   DZCON*8.
 9200
 9300                                   ;BUFFER PUT IN POINTER
 9400 026206                            KBBUFI: .BLKW   DZCON*8.
 9500
 9600                                   ;BUFFER TAKE OUT POINTER
 9700 026326                            KBBUFO: .BLKW   DZCON*8.
 9800
 9900
10000                                   ;HERE IF THE KEYBOARD BUFFER AREA
10100 026446                            KBBUF:  .BLKW   DZCON*8.*20.            ;8 WORDS TIMES 8 LINES TIMES # OF DZS
10200
10300
10400                                   ;DZ11 STATUS REG ADDRESS TABLE
10500 031546                            DZCSR:  .BLKW   DZCON           ;ONE CSR PER DZ11(REALLY.)
10600
10700                                   ;DZ11 RECIEVE ERROR BIT TABLE
10800 031560                            RECERR: .BLKW   DZCON*8.
```

```
                                      ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                      ;DZ SEND ROUTINE
                                      ;CALLING SEQUENCES
                                      ;         JSR      PC,SEND           ;CALL
                                      ;         R5                         ;THIS IS THE MESSAGE ADDRESS
                                      ;         MODE                       ;THIS SPECIFIES THE TYPE OF MESSAGE AS FOLLOWS...
                                      ; MODE        HIGH BYTE          LOW BYTE
                                      ;                  0               0          SEND TO ALL ACTIVE DZ LINES
                                      ;                  10              SELECT     ;SEND TO SELECTED LINE
                                      ;                                             ;USE LOW BYTE AS LINE NO.
                                      ;                  20              REPEAT     SEND TO ALL ACTIVE LINES
                                      ;                                             USE LOW BYTE AS THE MESSAGE REPEAT COUNT
                                      ;                  30              TERMIN     SEND TO ALL ACTIVE LINES
                                      ;                                             USE LOW BYTE AS MESSAGE TERMINATOR
                                      ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

031700  010046                        SEND:   MOV     R0,-(SP)          ;SAVE R0
031702  010146                                MOV     R1,-(SP)          ;AND R1
031704  010246                                MOV     R2,-(SP)          ;AND R2
031706  010537  001104                        MOV     R5,MSGADR
031712  122737  000010  001175                CMPB    #10,MODE+1        ;IS THIS MESSAGE MEANT FOR ONLY 1 TERMINAL?
031720  001014                                BNE     2$                ;NO.
031722  105037  001175                        CLRB    MODE+1            ;YES
031726  013700  001174                        MOV     MODE,R0           ;GET LINE #
031732  006300                                ASL     R0                ;MAKE WORD OFFSET
031734  005037  001174                        CLR     MODE              ;NO SPECIAL STUFF FOR INDIVIDUAL LINES
031740  012737  000001  001106                MOV     #1,SENDTM         ;COUNT = 1 LINE ONLY
031746  000137  031762                        JMP     SEND1             ;DO DO IT
031752  013737  001152  001106        2$:     MOV     NUMLIN,SENDTM     ; A COUNT OF LINES SO WE KNOW WHEN WE ARE THROUGH
031760  005000                                CLR     R0                ;START WITH THE 1ST LINE
031762  105760  020626                SEND1:  TSTB    DZLINE(R0)        ;IS THE LINE INACTIVE?
031766  100506                                BMI     7$                ;IF SO, DONT TRY TO SEND IT ANYTHING.
031770  026027  025006  000010                CMP     COMCNT(R0),#8.    ;ALREADY FULL?
031776  002435                                BLT     4$                ;IF ROOM IS THERE, PUT STUFF IN.
032000  005760  024046                        TST     ACTIVE(R0)        ;IS THE LINE ACTIVE ?
032004  100017                                BPL     2$                ;NO- DESELECT THE LINE
032006                                        STALL   100.              ;WAIT A SHORT TIME THEN RETRY
032006  013705  000144                        MOV     100.,R5           ;SETUP STALL TIME CONSTANT
032012  004737  033614                        JSR     PC,MSTALL
032016  005760  024546                        TST     STOP(R0)          ;IS LINE WAITING FOR XON
032022  100006                                BPL     1$                ;NO-
032024  105260  024046                        INCB    ACTIVE(R0)        ;COUNT THIS PASS THRU
032030  126027  024046  000310                CMPB    ACTIVE(R0),#200.          ;CHECK FOR EXCESSIVE DELAY
                                                                                ;ALLOW 20 SECONDS MAX.
032036  103002                                BHIS    2$                ;TOO LONG- ABORT WAIT
032040  000137  031762                1$:     JMP     SEND1
032044  052760  000200  020626        2$:     BIS     #BIT7,DZLINE(R0)          ;DESELECT THE LINE
032052  005337  001216                        DEC     UUT               ;ONE LESS UNIT TO TEST
032056  005060  024546                        CLR     STOP(R0)
032062  005060  024046                        CLR     ACTIVE(R0)
032066  000137  032204                        JMP     7$                ;TRY THE NEXT LINE
032072  013770  001104  025126        4$:     MOV     MSGADR,@COMIN(R0);PUT MESSAGE ADDRESS INTO THE COMMAND BUFFER
032100  105060  024046                        CLRB    ACTIVE(R0)        ;ERASE ANY DELAY COUNT
032104  062760  000002  025126                ADD     #2,COMIN(R0)      ;BUMP POINTER
032112  013770  001174  025126                MOV     MODE,@COMIN(R0)   ;PUT PRINTING MODE INTO THE BUFFER ALSO
032120  062760  000002  025126                ADD     #2,COMIN(R0)      ;BUMP POINTER
032126  026060  025366  025126                CMP     COMEND(R0),COMIN(R0);IN POINTER AT END OF COMMAND BUFFER?
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16500 032134  101003                          BHI     6$              ;IF NOT.
16600 032136  162760  000050  025126          SUB     #50,COMIN(R0)   ;YES, AT END. RESET IT TO THE BEGINING
16700 032144  005260  025006            6$:   INC     COMCNT(R0)      ;ADD 1 TO COUNT OF COMMANDS IN THERE
16800 032150  005760  024546                  TST     STOP(R0)        ;IS THE LINE WAITING FOR XON?
16900 032154  100413                          BMI     7$              ;YES. DONT SET TCR BIT
17000 032156  010001                          MOV     R0,R1
17100 032160  006201                          ASR     R1
17200 032162  006201                          ASR     R1
17300 032164  006201                          ASR     R1
17400 032166  042701  177761                  BIC     #177761,R1
17500 032172  016101  031546                  MOV     DZCSR(R1),R1    ;GET CSR ADDRESS
17600 032176  156061  025506  000004          BISB    TCRBIT(R0),4(R1);SET THE LINES TCR BIT
17700 032204  062700  000002            7$:   ADD     #2,R0           ;NEXT LINE #
17800 032210  005337  001106                  DEC     SENDTM          ;DONE ALL OF THEM?
17900 032214  001262                          BNE     SEND1           ;NO, GO DO ANOTHER
18000 032216  012602                          MOV     (SP)+,R2        ;NOW ALL WE HAVE TO DO IS
18100 032220  012601                          MOV     (SP)+,R1        ;RESTORE REGS WE
18200 032222  012600                          MOV     (SP)+,R0        ;SAVED UPON ENTRY
18300 032224  000207                          RTS     PC              ;RETURN
18400
18500
18600                                 ; SINGLE CHARACTER OUTPUT ROUTINE ALL TERMINALS
18700
18800 032226  162705  000040          CHROUT: SUB     #40,R5          ;CHARACTER TABLE STARTS AT 40
18900 032232  006305                          ASL     R5              ;MAKE WORD OFFSET
19000 032234  062705  042370                  ADD     #PCTABL,R5      ;ADD PRINT CHAR TABLE ADDRESS
19100 032240  004737  031700                  JSR     PC,SEND         ;SEND MESSAGE WORD
19200
19300 032244  000207                          RTS     PC
19400
```

```
 19600
 19700                                  ;HERE ARE THE TRANSMIT INTERRUPT ROUTINES
 19800 032246                           DZTINT:
 19900          000000                  X=0
 20000          000005                  .REPT   DZCON
 20100                                          MOV     R0,-(SP)        ;SAVE R0
 20200                                          MOV     #X,R0           ;PUT DZ # IN R0
 20300                                          JMP     TXINT           ;GO TO MAIN ROUTINE
 20400                                  X=X+2
 20500                                  .ENDR
       032246  010046                          MOV     R0,-(SP)        ;SAVE R0
       032250  012700  000000                   MOV     #X,R0           ;PUT DZ # IN R0
       032254  000137  032412                   JMP     TXINT           ;GO TO MAIN ROUTINE
               000002                   X=X+2
       032260  010046                          MOV     R0,-(SP)        ;SAVE R0
       032262  012700  000002                   MOV     #X,R0           ;PUT DZ # IN R0
       032266  000137  032412                   JMP     TXINT           ;GO TO MAIN ROUTINE
               000004                   X=X+2
       032272  010046                          MOV     R0,-(SP)        ;SAVE R0
       032274  012700  000004                   MOV     #X,R0           ;PUT DZ # IN R0
       032300  000137  032412                   JMP     TXINT           ;GO TO MAIN ROUTINE
               000006                   X=X+2
       032304  010046                          MOV     R0,-(SP)        ;SAVE R0
       032306  012700  000006                   MOV     #X,R0           ;PUT DZ # IN R0
       032312  000137  032412                   JMP     TXINT           ;GO TO MAIN ROUTINE
               000010                   X=X+2
       032316  010046                          MOV     R0,-(SP)        ;SAVE R0
       032320  012700  000010                   MOV     #X,R0           ;PUT DZ # IN R0
       032324  000137  032412                   JMP     TXINT           ;GO TO MAIN ROUTINE
               000012                   X=X+2
 20600
 20700
```

```
20900
21000 032330                            ;HERE ARE THE RECIEVE INTERRUPT ROUTINES
                                        DZRINT:
21100          000000                   X=0
21200          000005                   .REPT   DZCON
21300                                           MOV     R0,-(SP)        ;SAVE R0
21400                                           MOV     #X,R0           ;PUT DZ # IN R0
21500                                           JMP     RCINT           ;GO TO MAIN ROUTINE
21600                                   X-X+2
21700                                   .ENDR
        032330  010046                          MOV     R0,-(SP)        ;SAVE R0
        032332  012700  000000                  MOV     #X,R0           ;PUT DZ # IN R0
        032336  000137  033102                  JMP     RCINT           ;GO TO MAIN ROUTINE
                000002
                                        X X+2
        032342  010046                          MOV     R0,-(SP)        ;SAVE R0
        032344  012700  000002                  MOV     #X,R0           ;PUT DZ # IN R0
        032350  000137  033102                  JMP     RCINT           ;GO TO MAIN ROUTINE
                000004
                                        X-X+2
        032354  010046                          MOV     R0,-(SP)        ;SAVE R0
        032356  012700  000004                  MOV     #X,R0           ;PUT DZ # IN R0
        032362  000137  033102                  JMP     RCINT           ;GO TO MAIN ROUTINE
                000006
                                        X=X+2
        032366  010046                          MOV     R0,-(SP)        ;SAVE R0
        032370  012700  000006                  MOV     #X,R0           ;PUT DZ # IN R0
        032374  000137  033102                  JMP     RCINT           ;GO TO MAIN ROUTINE
                000010
                                        X=X+2
        032400  010046                          MOV     R0,-(SP)        ;SAVE R0
        032402  012700  000010                  MOV     #X,R0           ;PUT DZ # IN R0
        032406  000137  033102                  JMP     RCINT           ;GO TO MAIN ROUTINE
                000012
                                        X-X+2
21800
21900
```

```
 22100
 22200                                  ;HERE IS THE MAIN TRANSMIT INTERRUPT ROUTINE
 22300 032412  010146                   TXINT:  MOV     R1,-(SP)        ;SAVE ALL OF
 22400 032414  010246                           MOV     R2,-(SP)        ;REGS WE INTEND TO USE
 22500 032416  000240                           NOP
 22600 032420  016001  031546                   MOV     DZCSR(R0),R1    ;DZ11 CSR ADDRESS
 22800 032424  006300                           ASL     R0
 22900 032426  006300                           ASL     R0
 23000 032430  011137  001100                   MOV     (R1),DXTMP      ;GET LINE #
 23100 032434  113737  001101  001100           MOVB    DXTMP+1,DXTMP   ;MOVE INTO LOW BYTE
 23200 032442  042737  177770  001100           BIC     #177770,DXTMP   ;CLEAR ALL BITS EXCEPT LINE # BITS
 23300 032450  063700  001100                   ADD     DXTMP,R0        ;BIG LINE # IF DZ# PLUS LINE #
 23400 032454  006300                           ASL     R0              ;(DZ# *8 + LINE NO.)*2 FOR OFFSET
 23500 032456  005760  024546                   TST     STOP(R0)
 23600 032462  100005                           BPL     1$
 23700 032464  146061  025506  000004           BICB    TCRBIT(R0),4(R1)
 23800 032472  000137  032770                   JMP     9$
 23900 032476  052760  100000  024046   1$:     BIS     #BIT15,ACTIVE(R0)       ;SET LINE ACTIVE FLAG
 24000 032504  005760  024666                   TST     CURADD(R0)
 24100 032510  001012                           BNE     2$
 24200 032512  005760  025006                   TST     COMCNT(R0)
 24300 032516  001051                           BNE     4$
 24400 032520  146061  025506  000004           BICB    TCRBIT(R0),4(R1)
 24500 032526  005060  024046                   CLR     ACTIVE(R0)              ;CLEAR THE LINES ACTIVE FLAG
 24600 032532  000137  032770                   JMP     9$
 24700 032536  117037  024666  001100   2$:     MOVB    @CURADD(R0),DXTMP
 24800 032544  005260  024666                   INC     CURADD(R0)      ;POINT AT THE NEXT NEXT CHAR
 24900 032550  123760  001100  024306           CMPB    DXTMP,CURTER(R0);IS IT THE TERMINATOR?
 25000 032556  001101                           BNE     8$              ;NO. GO XMIT IT.
 25100 032560  005360  024166                   DEC     CURREP(R0)
 25200 032564  003071                           BGT     7$
 25300 032566  005060  024666                   CLR     CURADD(R0)
 25400 032572  062760  000004  025246           ADD     #4,COMOUT(R0)
 25500 032600  026060  025246  025366           CMP     COMOUT(R0),COMEND(R0)
 25600 032606  103403                           BLO     3$
 25700 032610  162760  000050  025246           SUB     #50,COMOUT(R0)
 25800 032616  005360  025006           3$:     DEC     COMCNT(R0)
 25900 032622  001007                           BNE     4$
 26000 032624  146061  025506  000004           BICB    TCRBIT(R0),4(R1)
 26100 032632  005060  024046                   CLR     ACTIVE(R0)
 26200 032636  000137  032770                   JMP     9$
 26300 032642  017060  025246  024666   4$:     MOV     @COMOUT(R0),CURADD(R0)
 26400 032650  005060  024166                   CLR     CURREP(R0)
 26500 032654  005060  024306                   CLR     CURTER(R0)
 26600 032660  016002  025246                   MOV     COMOUT(R0),R2   ;GET ADDR OF ADDR
 26700 032664  062702  000002                   ADD     #2,R2
 26800 032670  011237  001100                   MOV     (R2),DXTMP
 26900 032674  001416                           BEQ     6$
 27000 032676  122737  000020  001101           CMPB    #20,DXTMP+1
 27100 032704  001412                           BEQ     6$
 27200 032706  122737  000030  001101           CMPB    #30,DXTMP+1
 27300 032714  001401                           BEQ     5$
 27400 032716  000000                           HALT                    ;*********
 27500 032720  113760  001100  024306   5$:     MOVB    DXTMP,CURTER(R0)
 27600 032726  000137  032476                   JMP     1$
 27700 032732  105037  001101           6$:     CLRB    DXTMP+1
 27800 032736  013760  001100  024166           MOV     DXTMP,CURREP(R0)
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```
 27900 032744  000137  032476                        JMP     1$
 28000 032750  017060  025246  024666          7$:   MOV     @COMOUT(R0),CURADD(R0)
 28100 032756  000137  032476                        JMP     1$
 28200 032762  113761  001100  000006          8$:   MOVB    DXTMP,6(R1)     ;PUT CHAR INTO XMIT BUFFER
 28300 032770  012602                          9$:   MOV     (SP)+,R2        ;RESTORE THE
 28400 032772  012601                                MOV     (SP)+,R1        ;REGISTERS THAT WE
 28500 032774  012600                                MOV     (SP)+,R0        ;DESTROYED
 28600 032776  000002                                RTI
 28700
 28800
 28900
 29000                                      ; THIS ROUTINE IS USED TO RESET ALL TERMINALS
 29100
 29200 033000                               RESET0: SENDALL #MSG103         ;SET 6 LPI.
       033000  012705  037616                        MOV     #MSG103,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
       033004  005037  001174                        CLR     MODE
       033010  004737  031700                        JSR     PC,SEND         ;NOW SEND THE MESSAGE
 29300 033014                                        SENDALL #MSG108         ;SET 10 CPI.
       033014  012705  037677                        MOV     #MSG108,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
       033020  005037  001174                        CLR     MODE
       033024  004737  031700                        JSR     PC,SEND         ;NOW SEND THE MESSAGE
 29400 033030                                        SENDALL #T12FIX         ;RESET MARGINS
       033030  012705  007500                        MOV     #T12FIX,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
       033034  005037  001174                        CLR     MODE
       033040  004737  031700                        JSR     PC,SEND         ;NOW SEND THE MESSAGE
 29500 033044                                        SENDALL #MSG61          ;RESET ALL TABS
       033044  012705  037070                        MOV     #MSG61,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       033050  005037  001174                        CLR     MODE
       033054  004737  031700                        JSR     PC,SEND         ;NOW SEND THE MESSAGE
 29600 033060                                        SENDALL #MSG10          ;SET TABS EVERY 8
       033060  012705  034762                        MOV     #MSG10,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       033064  005037  001174                        CLR     MODE
       033070  004737  031700                        JSR     PC,SEND         ;NOW SEND THE MESSAGE
 29700 033074  004737  034166                        JSR     PC,QUIET
 29800 033100  000207                                RTS     PC
 29900
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```
                                        ;HERE IS THE MAIN RECIEVE INTERRUPT ROUTINE
033102  010546                  RCINT:  MOV     R5,-(SP)
033104  010246                          MOV     R2,-(SP)
033106  010146                          MOV     R1,-(SP)
033110  016001  031546                  MOV     DZCSR(R0),R1
033114  016105  000002                  MOV     2(R1),R5
033120  100401                          BMI     1$
033122  000000                          HALT    ;INVALID DATA FROM DZ ? ? ? ? ? ? ?
033124  010537  001200          1$:     MOV     R5,RCTMP
033130  113737  001201  001200          MOVB    RCTMP+1,RCTMP
033136  042737  177770  001200          BIC     #177770,RCTMP
033144  006300                          ASL     R0
033146  006300                          ASL     R0
033150  063700  001200                  ADD     RCTMP,R0
033154  006300                          ASL     R0
033156  050560  031560                  BIS     R5,RECERR(R0)           ;COPY ERROR BITS
033162  042760  107777  031560          BIC     #107777,RECERR(R0)      ;DATA VALID,LINE NO.,DATA
033170  042705  177400                  BIC     #177400,R5              ;CLEAR ERROR BITS
033174  032760  000200  020626          BIT     #BIT7,DZLINE(R0)        ;IS UNIT SELECTED ?
033202  001405                          BEQ     6$
033204  042760  000200  020626          BIC     #BIT7,DZLINE(R0)        ;SELECT THE LINE
033212  005237  001216                  INC     UUT                     ;ADD TO UNIT COUNT
033216  122705  000023          6$:     CMPB    #23,R5
033222  001010                          BNE     7$
033224  052760  100200  024546          BIS     #100200,STOP(R0);SET STOP FLAG & XOFF FLAGS
033232  146061  025506  000004          BICB    TCRBIT(R0),4(R1)        ;DISABLE TX INTR
033240  000137  033340                  JMP     RCRTN
033244  122705  000021          7$:     CMPB    #21,R5
033250  001013                          BNE     KBN
033252  156061  025506  000004  9$:     BISB    TCRBIT(R0),4(R1)        ;ENABLE TX INTR
033260  042760  100000  024546          BIC     #BIT15,STOP(R0) ;CLEAR STOP FLAG
033266  052760  000001  024546          BIS     #BIT0,STOP(R0)  ;SET XON FLAG
033274  000137  033340          8$:     JMP     RCRTN
033300  010570  026206          KBN:    MOV     R5,@KBBUFI(R0)  ;STICK IT IN THERE
033304  062760  000002  026206          ADD     #2,KBBUFI(R0)   ;GIVE THE POINTER A LITTLE PUSH TO THE NEXT EMPTY PL
033312  026060  026206  025746          CMP     KBBUFI(R0),KBBUFE(R0)   ;IS THAT THE END?
033320  001003                          BNE     1$              ;IF NOT.
033322  016060  026066  026206          MOV     KBBUFB(R0),KBBUFI(R0);YES IT WAS AT THE END. RESET IT
033330  105260  025626          1$:     INCB    KBCNT(R0)       ;TALLY UP ONE MORE ENTRY
033334  001001                          BNE     RCRTN           ;AND GO RETURN IF WE HAVE LESS THAN 377 OF THEM
033336  000000                          HALT                    ;400 ENRTYS IS TOO MANY. LET THIS HALT SERVE AS WARN
033340  005737  001140          RCRTN:  TST     HOOK            ;DOES ANOTHER ROUTINE WANT TO SEE CHARS IMMEDIATLY?
033344  001402                          BEQ     2$              ;NO. GO RETURN
033346  004777  145566                  JSR     PC,@HOOK        ;YES. GO OFF TO SOME MYSTERIOUS PLACE
033352  012601          2$:     MOV     (SP)+,R1
033354  012602                  MOV     (SP)+,R2
033356  012605                  MOV     (SP)+,R5
033360  012600                  MOV     (SP)+,R0        ;FROM INTERRUPT CATCHER
033362  000002                  RTI
```

```
                                        ;THIS IS THE TAKE STUFF OUT OF THE KBFO BUFFER ROUTINE
                                        ;CALL USING A "JSR PC".
                                        ;IT RETURNS WITH R5 = THE KBRST ENTRY
033364  105760  025626                  KBOUT:  TSTB    KBCNT(R0)       ;ANYTHING THERE?
033370  001003                                  BNE     1$              ;I HOPE SO
033372  012705  177777                          MOV     #-1,R5
033376  000420                                  BR      2$
033400  005360  025626                  1$:     DEC     KBCNT(R0)       ;REDUCE COUNT OF # ENTRYS IN THERE
033404  017005  026326                          MOV     @KBBUFO(R0),R5  ;GET KBRST ENTRY
033410  042705  000400                          BIC     #400,R5
033414  062760  000002  026326                  ADD     #2,KBBUFO(R0)   ;BUMP POINTER TO NEXT ENTRY
033422  022760  025746  026326                  CMP     #KBBUFE,KBBUFO(R0);REACHED THE END OF THE BUFFER SPACE?
033430  001003                                  BNE     2$              ;IF NOT, JUST RETURN
033432  016060  026066  026326                  MOV     KBBUFB(R0),KBBUFO(R0);YES, REACHED END. RESET POINTER TO THE BEGININ
033440  000207                          2$:     RTS     PC              ;RETURN
```

```
 37400
 37500                                  ;THIS SUBROUTINE DOES MANUAL INTERVENTION TESTING, WHERE A CARRIAGE RETURN
 37600                                  ;MUST BE SEEN TO CONTINUE
 37700                                  ;CALL WITH R3=ADDRESS OF 1ST PART OF REPEATING MESSAGE
 37800                                  ;          R4=ADDRESS OF 3RD PART OF REPEATING MESSAGE
 37900                                  ;          R2=ADDRESS OF TABLE OF 2ND PART OF MESSAGE
 38000                                  ;THE TABLE CONSISTS OF 2WORD ENTRIES. 1ST WORD IS MESSAGE ADDRESS
 38100                                  ;2ND WORD IS PARAMETER TO BE SEND TO THE DZ11 LINE
 38200                                  ;A 000000 WORD MARKS THE END OF THE TABLE.
 38300                                  ;CALL THIS SUBROUTINE WITH A JSR,PC
 38400 033442  005712                   ANVENT: TST     (R2)            ;TABLE FINISHED ?
 38500 033444  001462                           BEQ     4$              ;YES BRANCH
 38600 033446                                   SENDALL R3              ;SEND FIRST PART
       033446  010305                           MOV     R3,R5   ;BUILD SEND CALL USING MESSAGE ADDRESS
       033450  005037  001174                   CLR     MODE
       033454  004737  031700                   JSR     PC,SEND         ;NOW SEND THE MESSAGE
 38700 033460                                   SENDALL (R2)+           ;SEND FROM TABLE
       033460  012205                           MOV     (R2)+,R5        ;BUILD SEND CALL USING MESSAGE ADDRESS
       033462  005037  001174                   CLR     MODE
       033466  004737  031700                   JSR     PC,SEND         ;NOW SEND THE MESSAGE
 38800 033472                                   SENDALL R4              ;SEND LAST PART
       033472  010405                           MOV     R4,R5   ;BUILD SEND CALL USING MESSAGE ADDRESS
       033474  005037  001174                   CLR     MODE
       033500  004737  031700                   JSR     PC,SEND         ;NOW SEND THE MESSAGE
 38900 033504  004737  034166                   JSR     PC,QUIET        ;WAIT TILL DONE
 39000 033510  005000                           CLR     R0
 39100 033512  013700  001202                   MOV     DZNUM,R0        ;GET DZ NO.
 39200 033516  006300                           ASL     R0
 39300 033520  162700  000002           1$:     SUB     #2,R0
 39400 033524  100424                           BMI     3$
 39500 033526  016001  031546                   MOV     DZCSR(R0),R1    ;GET DZ CSR ADDRESS
 39600 033532  005037  001126                   CLR     ANTMP0
 39700 033536  013737  001126  001130   2$:     MOV     ANTMP0,ANTMP1
 39800 033544  061237  001130                   ADD     (R2),ANTMP1
 39900 033550  013761  001130  000002           MOV     ANTMP1,2(R1)
 40000 033556  005237  001126                   INC     ANTMP0
 40100 033562  022737  000010  001126           CMP     #10,ANTMP0
 40200 033570  001362                           BNE     2$
 40300 033572  000137  033520                   JMP     1$
 40400 033576  004737  034366           3$:     JSR     PC,AWAIT
 40500 033602  062702  000002                   ADD     #2,R2
 40600 033606  000137  033442                   JMP     ANVENT          ;DO FOR NEXT TABLE ENTRY
 40700 033612  000207                   4$:     RTS     PC              ;DONE ALL LINES ON ALL DZ'S. RETURN
 40800
```

```
 41000
 41100                                  ;STALL ROUTINE
 41200                                  ;CALL WITH JSR,PC
 41300                                  ;THE LOCATION FOLLOWING THE CALL SHOULD CONTAIN
 41400                                  ;THE AMOUNT OF MILLISECONDS TO HANG IN A NULL LOOP
 41500                                  ;RETURN IS TO THE LOCATION +4 OF THE CALL
 41600 033614  010537  001146           MSTALL: MOV     R5,LOOPO        ;GET # OF MILLISECONDS
 41700 033620  013737  001142  001144   1$:     MOV     LOOPC,LOOPI     ;SETUP CONSTANTFOR CORRECT STALLING TIME
 41800 033626  000240                   2$:     NOP
 41900 033630  005337  001144                   DEC     LOOPI
 42000 033634  001374                           BNE     2$
 42100 033636  005337  001146                   DEC     LOOPO           ;ONE MILLISECOND DOWN
 42200 033642  003366                           BGT     1$              ;SOME MORE TO GO
 42300 033644  000207                           RTS     PC              ;RETURN
 42400
 42500
 42600                                  ;BINARY TO ASCII CONVERT SUBROUTINE.
 42700                                  ;CALL USING A 'JSR PC'
 42800                                  ;DERIVES ASCII CHARACTERS REPRESENTING THE CONTENTS
 42900                                  ;OF LOCATION 'TEMP', AND PUTS THEM INTO THE 6 BYTES POINTED TO
 43000                                  ;BY R5
 43100                                  ;THIS IS A STOLLEN ROUTINE. IT IS ROTTENLY WRITEN
 43200
 43300 033646  113765  001134  000005   BIOCT:  MOVB    TEMP,5(R5)
 43400 033654  006037  001134                   ROR     TEMP
 43500 033660  113765  001135  000002           MOVB    TEMP+1,2(R5)
 43600 033666  006037  001134                   ROR     TEMP
 43700 033672  006037  001134                   ROR     TEMP
 43800 033676  113765  001134  000004           MOVB    TEMP,4(R5)
 43900 033704  006037  001134                   ROR     TEMP
 44000 033710  113765  001135  000001           MOVB    TEMP+1,1(R5)
 44100 033716  006037  001134                   ROR     TEMP
 44200 033722  006037  001134                   ROR     TEMP
 44300 033726  113765  001134  000003           MOVB    TEMP,3(R5)
 44400 033734  006037  001134                   ROR     TEMP
 44500 033740  113715  001135                   MOVB    TEMP+1,(R5)
 44600 033744  142715  000376                   BICB    #376,(R5)
 44700 033750  142765  000370  000001           BICB    #370,1(R5)
 44800 033756  142765  000370  000002           BICB    #370,2(R5)
 44900 033764  142765  000370  000003           BICB    #370,3(R5)
 45000 033772  142765  000370  000004           BICB    #370,4(R5)
 45100 034000  142765  000370  000005           BICB    #370,5(R5)
 45200 034006  152715  000060                   BISB    #60,(R5)
 45300 034012  152765  000060  000001           BISB    #60,1(R5)
 45400 034020  152765  000060  000002           BISB    #60,2(R5)
 45500 034026  152765  000060  000003           BISB    #60,3(R5)
 45600 034034  152765  000060  000004           BISB    #60,4(R5)
 45700 034042  152765  000060  000005           BISB    #60,5(R5)
 45800 034050  000207                           RTS     PC              ;YEAH
 45900
```

```
                                ;BINARY TO DEC.MAL CONVERT ROUTINE
                                ;CALL WITH A JSR SP
                                ;WROTE THIS MYSELF. ITS WONDERFULL.
034052  010346          BIDEC:  MOV     R3,-(SP)        ;SAVE R3
034054  010446                  MOV     R4,-(SP)        ;ALSO R4 WHICH WE WILL USE
034056  012704  034154          MOV     #BIDECC,R4      ;POINT R4 AT SOME CONSTANTS
034062  112725  000260          MOVB    #260,(R5)+      ;MAKE THE FIRTS DIGIT OF THE NUMBER 0
034066  100005                  BPL     1$              ;IS THE # POSITIVE?
034070  005137  001134          COM     TEMP            ;NO. MAKE IT SO
034074  112763  000235  177777  MOVB    #235,-1(R3)     ;AND CHANGE THAT 1ST DIGIT TO A "-"
034102  112713  000257  1$:     MOVB    #257,(R3)       ;INIT A DIGIT
034106  105213          2$:     INCB    (R3)            ;ADD 1 TO THE DIGIT
034110  161437  001134          SUB     (R4),TEMP       ;KEEP SUBTRACTING CONSTANT TILL IT GOES NEGATIVE
034114  100374                  BPL     2$              ;IF WE ARE STILL POSITIVE, DO IT AGAIN
034116  005203                  INC     R3              ;NO WE WENT NEGATIVE. POINT AT THE NEXT DIGIT
034120  062437  001134          ADD     (R4)+,TEMP      ;ADD BACK THE CONSTANT, AND GO ON TO THE NEXT CONSTA
034124  005714                  TST     (R4)            ;DONE THE 1ST 5 DIGITS YET?
034126  001365                  BNE     1$              ;IF NOT, GO BACK AND DO ANOTHER
034130  062737  000260  001134  ADD     #260,TEMP       ;YES. ONE REMAINS TO BE DONE
034136  113713  001134          MOVB    TEMP,(R3)       ;SET THE LAST DIGIT NOW.
034142  012637  001134          MOV     (SP)+,TEMP      ;RESTORE EVERYTHING
034146  012604                  MOV     (SP)+,R4        ;THAT WE USED TO
034150  012603                  MOV     (SP)+,R3        ;ITS ORIGINAL VALUE
034152  000206                  RTS     SP              ;AND RETURN

                                ;CONSTANTS
034154  023420          BIDECC: 10000.
034156  001750                  1000.
034160  000144                  100.
034162  000012                  10
034164  000000                  0.


                                ; WAIT FOR MESSAGE TO FINISH PRINTING

034166  010046          QUIET:  MOV     R0,-(SP)
034170  010146                  MOV     R1,-(SP)
034172  010546                  MOV     R5,-(SP)
034174  013700  001152          MOV     NUMLIN,R0       ;GET NO OF LINES
034200  006300                  ASL     R0
034202  005001          1$:     CLR     R1
034204  020100          2$:     CMP     R1,R0           ;IF DONE GO TO 5
034206  001414                  BEQ     5$
034210  005761  024046          TST     ACTIVE(R1)      ;STILL WORKING ?
034214  100403                  BMI     4$              ;STILL SET -BRANCH
034216  062701  000002  3$:     ADD     #2,R1           ;TEST NEXT LINE
034222  000770                  BR      2$
034224                  4$:     STALL   #10             ;DELAY A WHILE
034224  012705  000010          MOV     #10,R5          ;SETUP STALL TIME CONSTANT
034230  004737  033614          JSR     PC,MSTALL
034234  000137  034202          JMP     1$
034240  012605          5$:     MOV     (SP)+,R5
034242  012601                  MOV     (SP)+,R1
034244  012600                  MOV     (SP)+,R0
034246  000207                  RTS     PC
```

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                                        ;THIS IS THE REPLY SUBROUTINE
                                        ;CALL WITH A JSR PC
                                        ;IT WILL WAIT .5 SECONDS FOR REPLYS FROM ON ALL LINES
                                        ;IF IT SEES A REPLY, THE WORD FOR THE LINE IN THE REPTBL IS SET
034250  010046                  REPLY:  MOV     R0,-(SP)
034252  010146                          MOV     R1,-(SP)        ;SAVE REGS WE USE
034254  013700  001152                  MOV     NUMLIN,R0
034260  006300                          ASL     R0
034262  162700  000002          1$:     SUB     #2,R0
034266  100404                          BMI     2$
034270  005060  024426                  CLR     REPTBL(R0)
034274  000137  034262                  JMP     1$
034300  012737  034332  001140  2$:     MOV     #9$,HOOK        ;PUT CLAWS INTO INPUT ROUTINE
034306                          STALL   #500.           ;WAIT .5 SECONDS
034306  012705  000764                  MOV     #500.,R5                ;SETUP STALL TIME CONSTANT
034312  004737  033614                  JSR     PC,MSTALL
034316  012737  000000  001140          MOV     #0,HOOK         ;TAKE HOOK OUT OF INPUT ROUTINE
034324  012601                          MOV     (SP)+,R1
034326  012600                          MOV     (SP)+,R0
034330  000207                          RTS     PC              ;RETURN

034332  020527  000023          9$:     CMP     R5,#23          ;IS THE CHAR XOF?
034336  001007                          BNE     3$              ;NO.
034340  022705  000021                  CMP     #21,R5          ;IS THE CHAR XON?
034344  001407                          BEQ     4$              ;YES. LET RECIEVE ROUTINE HANDLE IT
034346  112760  000001  024427          MOVB    #1,REPTBL+1(R0) ;YES. SET HIGH BYTE
034354  000403                          BR      4$
034356  112760  000001  024426  3$:     MOVB    #1,REPTBL(R0)   ;SET LOW BYTE INDICATING NOT XON OR XOF
034364  000207                  4$:     RTS     PC



                                        ;THIS IS THE SUBROUTINE THAT WAITS FOR A CARRIAGE RETURN
034366  012737  000001  001136  AWAIT:  MOV     #1,NOTYET       ;SET NO CR YET SWITCH
034374  012737  034416  001140          MOV     #2$,HOOK        ;PUT HOOK INTO RECIEVE ROUTINE SO WE CAN TEST
034402  005737  001136          1$:     TST     NOTYET          ;SEEN A CARRIAGE RETURN YET?
034406  001375                          BNE     1$              ;NO, KEEP LOOKING
034410  005037  001140                  CLR     HOOK
034414  000207                          RTS     PC              ;RETURN

034416  042705  177600          2$:     BIC     #177600,R5      ;REMOVE JUNK FROM DATA BITS
034422  122705  000015                  CMPB    #15,R5          ;CARRIAGE RETURN ?
034426  001002                          BNE     3$              ;NO.
034430  005037  001136                  CLR     NOTYET          ;YES. MAKE THE SWITCH REFLECT IT
034434  004737  033364          3$:     JSR     PC,KBOUT        ;REMOVE CHAR FROM BUFFER
034440  000207                          RTS     PC
```

```
 100                                                    .SBTTL  SYSTEM MESSAGES
 200                                                    .NLIST BEX
 300 034442      012     015     103            MSG00: .ASCII   <12><15>/CZLAIAO LA00 DMT PROG/<15><12>
 400 034473      124     110     111                   .ASCII  /THIS TEST ASSUMES ALL TERMINALS ARE SETUP FOR/<12><15>
 500 034552      063     060     060                   .ASCIZ  /300 BAUD, 1 STOP, ODD PARITY, XOFF-XON./<12><15>
 600 034624      012     015     105            MSG01: .ASCIZ  <12><15>/END OF PASS /
 700 034643      012     015     105            MSG03: .ASCIZ  <12><15>/END OF PASS 000 TEST 00/<12><15>
 800 034677      116     117     040            MSG04: .ASCIZ  /NO RESPONSE TO ATTRIBUTE PROMPT/<12><15>
 900 034741      033     133     060            MSG05: .BYTE   33,133,60,143,0 ;TERMINAL ATTRIBUTE PROMPT
1000 034746      033     133     077            MSG06: .BYTE   33,133,77,63,73,60,143,0;LA00 DEV ATTRIBUTE RESPONSE
1100 034756      010     000                    MSG08: .ASCIZ  <10>
1200 034760      015     000                    MSG09: .ASCIZ  <15>
1300 034762      033     133     070            MSG10: .BYTE   33,133,70,73,61,66,73,62,64,73,63,62,73
1400 034777      064     060     073                   .BYTE   64,60,73,64,70,73,65,66,73,66,64,73,67,62,73,70,60
1500 035020      073     070     070                   .BYTE   73,70,70,73,71,66,73,61,60,64,73,61,61,62
1600 035036      073     061     062                   .BYTE   73,61,62,60,73,61,62,70,165,0
1700 035050      120     101     122            MSG12: .ASCIZ  /PARITY TEST 24/<12><15>
1800 035071      120     114     105            MSG13: .ASCIZ  /PLEASE SETUP FOR /
1900 035113      110     111     124            MSG14: .ASCIZ /HIT RETURN KEY WHEN YOU ARE DONE WITH ALL TERMINALS/<12><15>
2000 035201      102     101     104            MSG15: .ASCIZ  /BAD PARITY RECIEVED FROM LA00/<12><15>
2100 035241      104     101     124            MSG16: .ASCIZ  /DATA OVERRUN ERROR /<12><15>
2200 035267      067     040     102            MSG17: .ASCIZ  /7 BIT AND SPACE./
2300 035310      103     110     101            MSG18: .ASCII  /CHAR CODE ECHO TEST 21/<12><15>
2400 035340      124     131     120            MSG19: .ASCIZ  /TYPE DELETE TO EXIT/<1  <15>
2500 035366      067     040     102            MSG20: .ASCIZ  /7 BIT AND ODD PARITY./
2600 035414      067     040     102            MSG21: .ASCIZ  /7 BIT AND EVEN PARITY./
2700 035443      044     012     015            MSG22: .ASCIZ  /$/<12><15>
2800 035447      130     117     116            MSG25: .ASCIZ  /XON-XOFF TEST 23/<12><15>
2900 035472      124     125     122            MSG26: .ASCIZ  /TURN THIS TERMINAL OFF-LINE, THEN ON-LINE/<12><15>
3000 035546      102     101     125            MSG27: .ASCIZ  /BAUD RATE TEST 17./<12><15>
3100 035573      110     117     122            MSG28: .ASCIZ  /HORIZONTAL MOTION TEST 11/<12><15>
3200 035627      060     060     060            MSG29: .ASCIZ  /000   /
3300 035636      120     114     105            MSG30: .ASCIZ  /PLEASE SETUP FOR /
3400 035660      040     102     101            MSG31: .ASCIZ  / BAUD./<12><15>/ HIT RETURN WHEH DONE FOR ALL TERMINALS./<12><15>
3500 035743      061     061     060            MSG32: .ASCIZ  /110/
3600 035747      116     125     114            MSG33: .ASCII  /NULSOHSTXETXEOTENQACKBELBS HT LF /
3700 036010      126     124     040                   .ASCII  /VT FF CR SO SI DLEXONDC2XOFDC4NAK/
3800 036051      123     131     116                   .ASCII  /SYNETBCANEM SUBESCFS GS RS US SP /
3900 036112      063     060     060            MSG35: .ASCIZ  /300/
4000 036116      040     102     101            MSG36: .ASCIZ  / BAUD/<12><15>
4100 036126      102     125     106            MSG37: .ASCIZ  /BUFFER OVERRUN TEST 12/<12><15>
4200 036157      033     133     061            MSG38: .BYTE   33,133,61,73,61,63,62,165,0
4300 036170      105     122     122            MSG39: .ASCIZ  /ERROR * XON NEVER RECIEVED/<12><15>
4400 036225      105     122     122            MSG40: .ASCIZ  /ERROR * XOFF NEVER RECIEVED/<12><15>
4500 036263   000011                            MSG41: .REPT 9.
4600                                                   .ASCII  /X/<11>/X/<12><15>
4700                                                   .ENDR
      036263      130     011     130                  .ASCII  /X/<11>/X/<12><15>
      036270      130     011     130                  .ASCII  /X/<11>/X/<12><15>
      036275      130     011     130                  .ASCII  /X/<11>/X/<12><15>
      036302      130     011     130                  .ASCII  /X/<11>/X/<12><15>
      036307      130     011     130                  .ASCII  /X/<11>/X/<12><15>
      036314      130     011     130                  .ASCII  /X/<11>/X/<12><15>
      036321      130     011     130                  .ASCII  /X/<11>/X/<12><15>
      036326      130     011     130                  .ASCII  /X/<11>/X/<12><15>
      036333      130     011     130                  .ASCII  /X/<11>/X/<12><15>
4800          000003                                   .REPT 3
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4900                                                    .ASCII  /                       /
5000                                                    .BYTE   10,10,10,10,10,10,10,10,10,10
5100                                                    .BYTE   10,10,10,10,10,10,10,10,10,10
5200                                                    .ENDR
     036340    040     040     040                      .ASCII  /                       /
     036364    010     010     010                      .BYTE   10,10,10,10,10,10,10,10,10,10
     036376    010     010     010                      .BYTE   10,10,10,10,10,10,10,10,10,10
     036410    040     040     040                      .ASCII  /                       /
     036434    010     010     010                      .BYTE   10,10,10,10,10,10,10,10,10,10
     036446    010     010     010                      .BYTE   10,10,10,10,10,10,10,10,10,10
     036460    040     040     040                      .ASCII  /                       /
     036504    010     010     010                      .BYTE   10,10,10,10,10,10,10,10,10,10
     036516    010     010     010                      .BYTE   10,10,10,10,10,10,10,10,10,10
5300 036530    012     012     012                      .ASCIZ  <12><12><12><15>
5400 036535    124     105     123             MSG42:   .ASCIZ  /TEST 00 - DATA PATH TEST/<12><15><12>
5500 036571    052     125     052             MSG43:   .ASCIZ  /*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/<12><1
5600 036670    124     105     130             MSG44:  .ASCIZ   /TEXT 02 - NON PRINTING CHARACTER TEXT. THE NEXT LINE SHOULD BE BLAN
5700 037000    C02     006     020             MSG45:   .BYTE   2,6,20,23,26,31,35,177,21,24,27,32,36,22,25,30,34,37,21,12,15,0
5800 037026    130     040     000             MSG47:   .ASCIZ /X /
5900 037031    124     105     123             MSG60:   .ASCIZ  /TEST 07  HORIZONTAL TAB TEST/<12><15>
6000 037070    033     062     000             MSG61:   .ASCIZ  <33>/2/
6100 037073    056     000                     MSG62:   .ASCIZ  /./
6200 037075    033     110     000             MSG63:   .ASCIZ  <33>/H/
6300 037100    126     000                     MSG64:   .ASCIZ  /V/
6400 037102    011     000                     MSG65:   .ASCIZ  <11>
6500 037104    015     000                     MSG66:   .ASCIZ  <15>
6600 037106    130     000                     MSG67:   .ASCIZ  /X/
6700 037110    012     015     011             MSG68:   .BYTE   12,15,11,0
6800 037114    C77     040     000             MSG70:   .ASCIZ  /? /
6900 037117    077     040     040             MSG71:   .ASCIZ  /?  /
7000 037123    077     040     040             MSG72:   .ASCIZ  /?   /
7100 037130    012     015     120             MSG73:   .ASCIZ  <12><15>/POWER FAIL TRAP/<12><15>
7200 037154    012     015     000             MSG75:   .ASCIZ  <12><15>
7300 037157    012     012     012             MSG77:   .ASCIZ  <12><12><12><15>
7400
7500 037164    123     120     101             MSG78:   .ASCIZ  /SPACE - BACKSPACE TEST 05/<12><15><12>
7600 037221    057     040     000             MSG79:   .ASCIZ  */ *
7700 037224    010     010     134             MSG80:   .ASCIZ  <10><10>/\/<10>
7800 037231    101     114     114             MSG81:   .ASCIZ  /ALL PRINTABLE CHARACTERS TEST01/<12><15>
7900 037273    040     000                     MSG82:   .ASCIZ  / /
8000 037275    104     117     124             MSG83:   .ASCIZ  /DOT MATRIX TEST 03/<12><15>
8100 037322    132     110     052             MSG84:   .ASCIZ  /ZH*#$  /<12><15>
8200 037334    132     040     132             MSG85:   .ASCII  /Z ZZ  ZZZ   ZZZZ/<15>
8300 037355    110     040     110                      .ASCII  /H HH  HHH   HHHH/<15>
8400 037376    052     040     052                      .ASCII  /* **  ***   ****/<15>
8500 037417    043     040     043                      .ASCII  /# ##  ###   ####/<15>
8600 037440    044     040     044                      .ASCIZ  /$ $$  $$$   $$$$/<12><15>
8700 037463    012     015     124             MSG88:   .ASCIZ  <12><15>/THIS LINE PRINTED AT /
8800 037513    040     061     060             MSG89:   .ASCIZ  / 10 /
8900 037520    040     061     062             MSG90:   .ASCIZ  / 12 /
9000 037525    061     063     056             MSG91:   .ASCIZ  /13.2/
9100 037532    061     066     056             MSG92:   .ASCIZ  /16.5/
9200 037537    040     103     120             MSG93:   .ASCIZ  / CPI./
9300 037545    040     063     040             MSG94:   .ASCIZ  / 3 /
9400 037551    040     064     040             MSG95:   .ASCIZ  / 4 /
9500 037555    040     066     040             MSG96:   .ASCIZ  / 6 /
9600
```

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 9700 037561  040  070  040        MSG97:  .ASCIZ  / 8 /
 9800 037565  114  120  111        MSG98:  .ASCIZ  /LPI./
 9900 037572  033  133  064        MSG99:  .BYTE   33,133,64,167,0
10000 037577  033  133  063        MSG100: .BYTE   33,133,63,167,0
10100 037604  033  133  062        MSG101: .BYTE   33,133,62,167,0
10200 037611  033  133  064        MSG102: .BYTE   33,133,64,172,0
10300 037616  033  133  061        MSG103: .BYTE   33,133,61,172,0
10400 037623  033  133  063        MSG104: .BYTE   33,133,63,172,0
10500 037630  033  133  065        MSG105: .BYTE   33,133,65,172,0
10600 037635  033  133  062        MSG106: .BYTE   33,133,62,172,0
10700 037642  012  015  101        MSG107: .ASCIZ  <12><15>/ABCDEFGHIJKLMNOPQRSTUVWXYZ/
10800 037677  033  133  061        MSG108: .BYTE   33,133,61,167,0
10900 037704  110  117  122        MSG109: .ASCIZ  /HORIZONTAL PITCH TEST 04/<12><15>
11000 037737  126  105  122        MSG110: .ASCIZ  /VERTICAL PITCH TEST 13/<12><15>
11100 037770  123  105  124        MSG111: .ASCIZ  /SE1 MARGINS TEST 06/<15>
11200 040015  033  133  060        MSG113: .BYTE   33,133,60,60,61,73,61,63,62,163,0
11300 040030  033  133  060        MSG114: .BYTE   33,133,60,60,60,73,60,60,60,163,0
11400 040043  075  000              MSG115: .ASCIZ  /=/
11500 040045  105  122  122        MSG116: .ASCIZ  /ERROR IF NOT AT LH MARGIN/<12><15>
11600 040101  033  133  066        MSG117: .BYTE   33,133,66,172,0
11700 040106  040  062  040        MSG118: .ASCIZ  / 2 /
11800 040112  120  122  111        MSG120: .ASCIZ  /PRINTER BELL TEST 14/<12><15>
11900 040141  115  125  114        MSG123: .ASCIZ  /MULTIPLE LINE FEED TEST 10/<12><15>
12000 040176  055  055  055        MSG124: .ASCIZ  /------------/<15>
12100 040214  055  055  055        MSG125: .ASCIZ  /------00/<15>
12200 040226  123  105  124        MSG140: .ASCII  /SET CAPS LOCK OFF, SHIFT LOCK OFF, THEN /
12300 040276  120  122  105                .ASCII  /PRESS ALL PRINTING KEYS./
12400 040326  012  015  104                .ASCII  <12><15>/DON'T PRESS  ESC, TAB, RETURN/
12500 040365  054  040  102                .ASCII  /, BS, OR FUNCTION KEYS./<12><15>
12600 040416  120  122  105        MSG145: .ASCIZ  /PRESS THE SPACE BAR LAST./<12><15>
12700 040452  120  122  105        MSG142: .ASCIZ  /PRESS THE SPACE BAR IF FINISHED/<12><15>
12800 040514  040  072  040        MSG143: .ASCIZ  / : KEYS WERE NOT RECIEVED/<12><15>
12900 040550  124  122  131        MSG144: .ASCIZ  /TRY AGAIN , /
13000 040565  012  015  105        MSG146: .ASCIZ  <12><15>/ERROR * /
13100 040600  111  116  126        MSG148: .ASCIZ  /INVALID CODE RECVD : /
13200 040626  124  105  123        MSG147: .ASCIZ  /TEST #21/<12><15>
13300 040641  120  122  105        MSG150: .ASCIZ  /PRESS /<12><15>
13400 040652  040  122  110        MSG152: .ASCIZ  / RH SHIFT AND B/<12><15>
13500 040674  123  105  124        MSG156: .ASCIZ  /SET SHIFT LOCK , /
13600 040716  077  077  077        MSG149: .ASCIZ  /???/
13700 040722  040  114  110        MSG151: .ASCIZ  / LH SHIFT  AND  'A/<12><15>
13800 040747  064  012  015        MSG153: .ASCIZ  /4/<12><15>
13900 040753  040  103  124        MSG154: .ASCIZ  / CTL-P/<12><15>
14000 040764  040  105  123        MSG155: .ASCIZ  / ESCAPE/<12><15>
14100 040776  122  105  123        MSG157: .ASCIZ  /RESET SHIFT LOCK, SET  CAPS LOCK, /
14200 041041  124  101  102        MSG158: .ASCIZ  /TAB/<12><15>
14300 041047  122  105  124        MSG159: .ASCIZ  /RETURN/<12><15>
14400 041060  060  061  062        MSG160: .ASCIZ  /0123456789/
14500 041073  077  012  015        MSG162: .ASCIZ  /?/<12><15>
14600 041077  111  116  126        MSG163: .ASCIZ  /INVALID SEQUENCE RECVD/<12><15>
14700 041130  115  111  101        MSG164: .ASCIZ  /MIAN KEYBOARD TEST 20/<12><15>
14800 041160  123  120  101        MSG165: .ASCIZ  /SPACE/
14900 041166  102  101  103        MSG166: .ASCIZ  /BACKSPACE/<12><15>
15000 041202  114  111  116        MSG167: .ASCIZ  /LINEFEED/<12><15>
15100 041215  104  105  114        MSG168: .ASCIZ  /DELETE/<12><15>
15200 041226  104  012  015        MSG169: .ASCIZ  /D/<12><15>
15300 041232  040  000              MSG170: .ASCIZ  / /
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 15400 041234      033      133      062          MSG180: .BYTE   33,133,62,73,62,66,163,0
 15500 041244      033      133      062          MSG181: .BYTE   33,133,62,66,73,65,60,163,0
 15600 041255      033      133      065          MSG182: .BYTE   33,133,65,62,73,67,66,163,0
 15700 041266      033      133      067          MSG183: .BYTE   33,133,67,70,73,61,60,62,163,0
 15800 041300      033      133      061          MSG184: .BYTE   33,133,61,60,60,73,61,62,64,163,0
 15900 041313      114      111      106          MSG270: .ASCIZ  /LIFE TEST #15/<12><15>
 16000 041333      114      101      060          MSG280: .ASCIZ  /LA00 DYNAMIC EXERCISOR TEST 16/<12><15>
 16100 041374      077      000                   MSG281: .ASCIZ  /?/
 16200 041376      040      060      060          MSG271: .ASCIZ  / 00 /
 16300 041403      012      015      105          MSG303: .ASCIZ  <12><15>/ENTER SETUP MODE, THEN TYPE THE FOLLOWING : /
 16400 041462      105      130      111          MSG304: .ASCIZ  /EXIT SETUP MODE , AND TYPE A CTL-Q/<12><15>
 16500 041527      126      075      106          MSG308: .ASCIZ  /V=F(CR)/<12><15>
 16600 041541      110      075      104          MSG309: .ASCIZ  /H=D(CR)/<12><15>
 16700 041553      110      075      103          MSG310: .ASCIZ  /H=C(CR)/<12><15>
 16800 041565      110      075      102          MSG311: .ASCIZ  /H=B(CR)/<12><15>
 16900 041577      110      075      101          MSG312: .ASCIZ  /H=A(CR)/<12><15>
 17000 041611      126      075      101          MSG313: .ASCIZ  /V=A(CR)/<12><15>
 17100 041623      126      075      102          MSG314: .ASCIZ  /V=B(CR)/<12><15>
 17200 041635      126      075      104          MSG315: .ASCIZ  /V=D(CR)/<12><15>
 17300 041647      126      075      105          MSG316: .ASCIZ  /V=E(CR)/<12><15>
 17400 041661      126      075      103          MSG317: .ASCIZ  /V=C(CR)/<12><15>
 17500 041673      116      117      040          MSG318: .ASCIZ  /NO RESPONSE RECIEVED/<12><15>
 17600 041722      120      111      124          MSG320: .ASCIZ  /PITCH SETUP TEST 22/<12><15>
 17700 041750      133      055      055          MSG321: .ASCII  /[-----/<12><15>
 17800 041760      133      055      055                  .ASCII  /[-----/<12><15>
 17900 041770      133      055      055                  .ASCII  /[-----/<12><15>
 18000 042000      133      055      055                  .ASCII  /[-----/<12><15>
 18100 042010      133      055      055          MSG322: .ASCII  /[-----/<12><15>
 18200 042020      133      055      055                  .ASCII  /[-----/<12><15>
 18300 042030      133      055      055          MSG323: .ASCII  /[-----/<12><15>
 18400 042040      133      055      055                  .ASCII  /[-----/<12><15>
 18500 042050      133      055      055          MSG324: .ASCII  /[-----/<12><15>
 18600 042060      133      055      055          MSG325: .ASCII  /[-----/<12><15>
 18700 042070      133      055      055          MSG326: .ASCII  /[-----/<12><15>
 18800 042100      133      055      055                  .ASCIZ  /[-----/<12><15><12><12>
 18900 042113      012      015      122          MSGK1:  .ASCIZ  <12><15>/READY/<12><15>
 19000 042125      105      116      124          MSGK2:  .ASCIZ  /ENTER MODE  D OR P :/
 19100 042152      077      040      077          MSGK3:  .ASCIZ  /? ? ? ?/<12><15>
 19200 042164      012      015      105          MSGK4:  .ASCIZ  <12><15>/ENTER COMMAND(S) /<12><15>
 19300 042212      122      125      116          MSGK5:  .ASCIZ  /RUN INTERVENTION TEST ?/<12><15>
 19400 042244      007      012      015          MSGK6:  .ASCIZ  <007><12><15>/NO TERMINALS SELECTED/<007><12><15>
 19500 042300      012      015      105          MSGS1:  .ASCIZ  <12><15>/ERROR * INVALID TEST NO./<12><15><07>
 19600 042336      012      015      105          MSGS2:  .ASCIZ  <12><15>/ERROR * PMT CONFLICT/<12><15><07>
 19700                                           .EVEN
 19800 042370   000040   000041   000042          PCTABL: .WORD   40,41,42,43,44,45,46,47,50,51,52,53,54,55,56,57
 19900 042430   000060   000061   000062                  .WORD   60,61,62,63,64,65,66,67,70,71,72,73,74,75,76,77
 20000 042470   000100   000101   000102                  .WORD   100,101,102,103,104,105,106,107,110,111,112
 20100 042516   000113   000114   000115                  .WORD   113,114,115,116,117,120,121,122,123,124,125,126
 20200 042546   000127   000130   000131                  .WORD   127,130,131,132,133,134,135,136,137,140,141,142
 20300 042576   000143   000144   000145                  .WORD   143,144,145,146,147,150,151,152,153,154,155,156
 20400 042626   000157   000160   000161                  .WORD   157,160,161,162,163,164,165,166,167,170
 20500 042652   000171   000172   000173                  .WORD   171,172,173,174,175,176
 20600          001220                           .END    START
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ACTDVC  000041        END22   014370        MSG101  037604        MSG180  041234        MSG63   037075
ACTIVE  024046        EOP     003634        MSG102  037611        MSG181  041244        MSG64   037100
ANTMP0  001126        EOPT    003510        MSG103  037616        MSG182  041255        MSG65   037102
ANTMP1  001130        ERROR   001110        MSG104  037623        MSG183  041266        MSG66   037104
ANTMP2  001132        ERRORT  020346        MSG105  037630        MSG184  041300        MSG67   037106
ANVENT  033442        FLAG21  014302        MSG106  037635        MSG19   035340        MSG68   037110
ANYWAY  004104        GETPN   016264        MSG107  037642        MSG20   035366        MSG70   037114
APTHDR  001000        GETSWS  004036        MSG108  037677        MSG21   035414        MSG71   037117
AWAIT   034366        GETTST  003356        MSG109  037704        MSG22   035443        MSG72   037123
BIDEC   034052        GO      001214        MSG110  037737        MSG25   035447        MSG73   037130
BIDECC  034154        HOOK    001140        MSG111  037770        MSG26   035472        MSG75   037154
BIOCT   033646        INIT    001342        MSG113  040015        MSG27   035546        MSG77   037157
BIT0  = 000001        INIT1   001542        MSG114  040030        MSG270  041313        MSG78   037164
BIT1  = 000002        INIT2   001614        MSG115  040043        MSG271  041376        MSG79   037221
BIT10 = 002000        INIT3   001674        MSG116  040045        MSG28   035573        MSG80   037224
BIT11 = 004000        INIT4   001726        MSG117  040101        MSG280  041333        MSG81   037231
BIT12 = 010000        INIT5   001760        MSG118  040106        MSG281  041374        MSG82   037273
BIT13 = 020000        INIT6   002046        MSG12   035050        MSG29   035627        MSG83   037275
BIT14 = 040000        ISEQ    002220        MSG120  040112        MSG30   035636        MSG84   037322
BIT15 = 100000        KBBUF   026446        MSG123  040141        MSG303  041403        MSG85   037334
BIT2  = 000004        KBBUFB  026066        MSG124  040176        MSG304  041462        MSG88   037463
BIT3  = 000010        KBBUFE  025746        MSG125  040214        MSG308  041527        MSG89   037513
BIT4  = 000020        KBBUFI  026206        MSG13   035071        MSG309  041541        MSG90   037520
BIT5  = 000040        KBBUFO  026326        MSG14   035113        MSG31   035660        MSG91   037525
BIT6  = 000100        KBCNT   025626        MSG140  040226        MSG310  041553        MSG92   037532
BIT7  = 000200        KBN     033300        MSG142  040452        MSG311  041565        MSG93   037537
BIT8  = 000400        KBOUT   033364        MSG143  040514        MSG312  041577        MSG94   037545
BIT9  = 001000        KEYEND  014300        MSG144  040550        MSG313  041611        MSG95   037551
CHARIN  001170        KEYTBL  014140        MSG145  040416        MSG314  041623        MSG96   037555
CHROUT  032226        KSTART  001242        MSG146  040565        MSG315  041635        MSG97   037561
CODTBL  014352        LOOPC   001142        MSG147  040626        MSG316  041647        MSG98   037565
COLTBL  010756        LOOPI   001144        MSG148  040600        MSG317  041661        MSG99   037572
COMCNT  025006        LOOPO   001146        MSG149  040716        MSG318  041673        MSTALL  033614
COMEND  025366        LSEQ    002450        MSG15   035201        MSG32   035743        NOTYET  001136
COMIN   025126        MODCON  003460        MSG150  040641        MSG320  041722        NUMCHK  020230
COMOUT  025246        MODE    001174        MSG151  040722        MSG321  041750        NUMLIN  001152
COM1    001154        MSGADR  001104        MSG152  040652        MSG322  042010        ONLINE  001204
COM2    001156        MSGE    020604        MSG153  040747        MSG323  042030        PASSNO  001124
COUNT   010070        MSGK1   042113        MSG154  040753        MSG324  042050        PCTABL  042370
CSEND   020304        MSGK2   042125        MSG155  040764        MSG325  042060        PFAIL   000024
CTLTBL  014304        MSGK3   042152        MSG156  040674        MSG326  042070        PMODE   001176
CURADD  024666        MSGK4   042164        MSG157  040776        MSG33   035747        PNTR    001206
CURREP  024166        MSGK5   042212        MSG158  041041        MSG35   036112        PRIO  = 000000
CURTER  024306        MSGK6   042244        MSG159  041047        MSG36   036116        PRI4  = 000200
DLRVEC= 000060        MSGS1   042300        MSG16   035241        MSG37   036126        PRI7  = 000340
DLTVEC= 000064        MSGS2   042336        MSG160  041060        MSG38   036157        QUIET   034166
DXTMP   001100        MSGTYP  001102        MSG162  041073        MSG39   036170        RCINT   033102
D.ADDR  001074        MSG00   034442        MSG163  041077        MSG40   036225        RCRTN   033340
DZCUMB  020746        MSG01   034624        MSG164  041130        MSG41   036263        RCTMP   001200
DZCON - 000005        MSG03   034643        MSG165  041160        MSG42   036535        REAL    003334
DZCSR   031546        MSG04   034677        MSG166  041166        MSG43   036571        RECERR  031560
DZLINE  020626        MSG05   034741        MSG167  041202        MSG44   036670        REPLY   034250
DZNUM   001202        MSG06   034746        MSG168  041215        MSG45   037000        REPTBL  024426
DZRINT  032330        MSG08   034756        MSG169  041226        MSG47   037026        RESET0  033000
DZTINT  032246        MSG09   034760        MSG17   035267        MSG60   037031        RSEQ    002754
DZVECT  001076        MSG10   034762        MSG170  041232        MSG61   037070        SCAN    004216
EBUF    020574        MSG100  037577        MSG18   035310        MSG62   037073        SEND    031700
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CZLAIAO LA00 DMT PROG MACRO M1110 20-APR-78 04:21 PAGE 44-5
SYMBOL TABLE SEQ 0098

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SENDTM  001106          TBL12B  007466          TEST12  011164          T12FIX  007500          $ETABL  001034
SEND1   031762          TBL12C  007473          TEST13  011630          T17A    012134          $ETEND  001074
SEQ     001112          TBL31A  017020          TEST14  012170          T17B    012136          $FATAL  001016
SEQM$   002342          TBL31C  017114          TEST15  015676          T21E    013772          $MAIL   001014
SEQ8    002316          TBL31D  017140          TEST16  016334          T30BUF  016320          $MEMAD  001044
SHITBL  014314          TBL31E  017150          TEST17  004612          UUT     001216          $MEMAR  001046
SO      001116          TBL31F  017164          TEST20  012260          VALID   003302          $MEMA2  001050
SRCONT  001120          TBL31G  017210          TEST21  014412          WIDTH   001172          $MEMA3  001054
START   001220          TCRBIT  025506          TEST22  015214          WORK    001160          $MEMA4  001060
STOP    024546          TEMP    001134          TKBUF   020326          WORK1   001162          $MEMR2  001052
SWR     001122          TEST    001114          TMPTST  001210          WORK2   001164          $MEMR3  001056
SWRTST  003754          TEST00  005410          TRAP4   000004          WORK3   001166          $MEMR4  001062
TAB     010066          TEST01  005452          TSTMP   001150          WSEQ    002336          $MSGAD  001030
TABLH   006372          TEST02  005700          TSTTBL  004424          W1      007512          $MSGL   001032
TABLHF  006402          TEST03  005732          TSTTYP  001212          W2      007514          $PASNO  001022
TABLV   012140          TEST04  006040          TTYIN   017234          W3      007516          $SWREG  001036
TABLVF  012154          TEST05  006412          TXINT   032412          X     = 000012          $TSTNO  001020
TABL13  010050          TEST06  006610          T03TBL  005374          $BASE   001070          $UNIT   001026
TABL24  015622          TEST07  007520          T03TB2  005402          $CPU    001042          $VECT1  001064
TAB24B  015650          TEST10  010072          T11A    006366          $DEVCT  001024          $VECT2  001066
TBL12A  007454          TEST11  010464          T11B    006370          $DEVM   001072

. ABS.  042666      000
        000000      001
ERRORS DETECTED:  0

VIRTUAL MEMORY USED:  4382 WORDS  ( 18 PAGES)
DYNAMIC MEMORY:  5956 WORDS  ( 22 PAGES)
ELAPSED TIME:  00:01:14
CZLAIA.BIN,CZLAIA.LST/-SP-CZLAIA.P11
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