VT50/52/55

VT50A,B,H/52 ACCEPTANCE TEST

MD-11-DZVTC-E

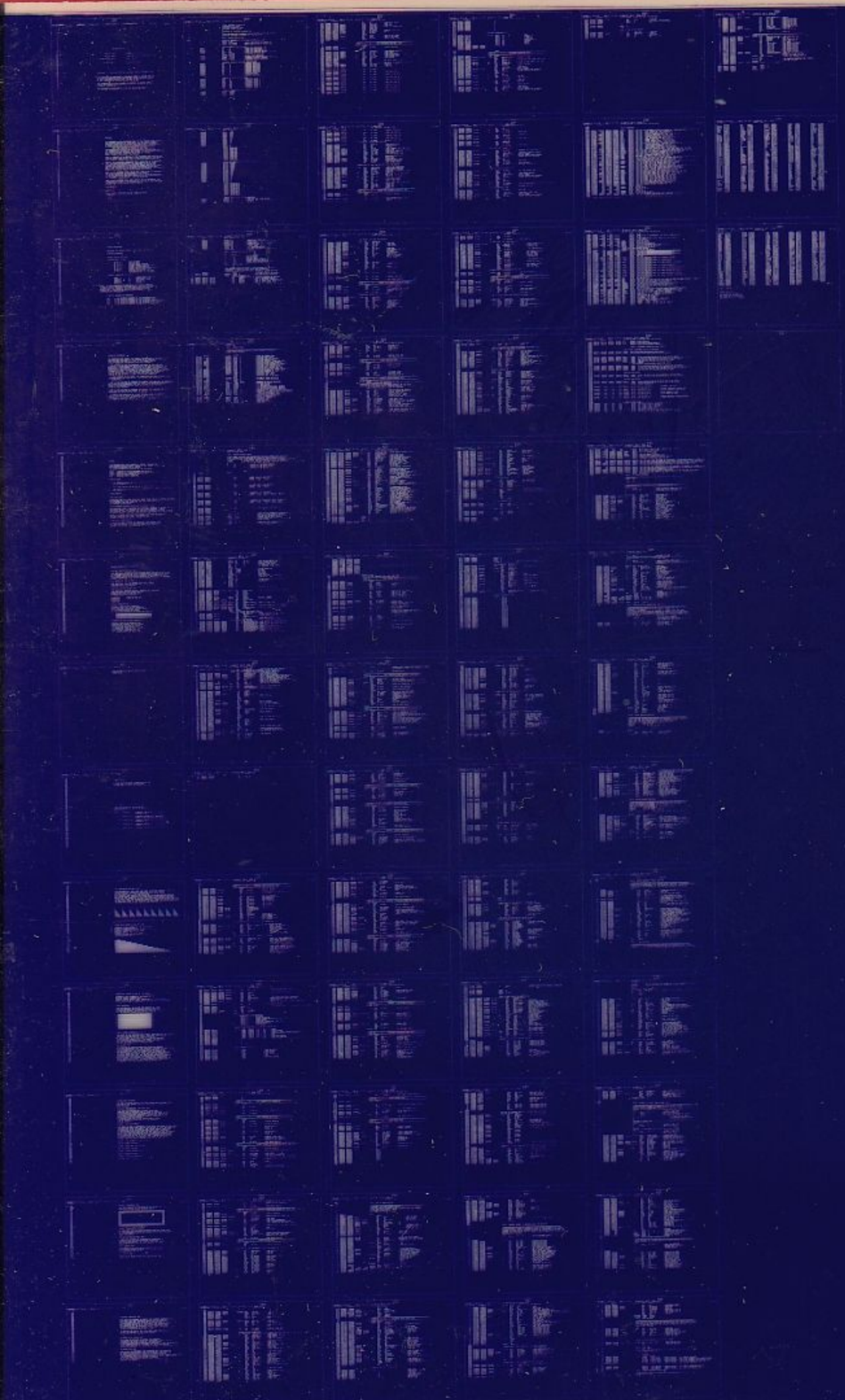
EP-DZVTC-E-DL-E

FICHE 1 OF 1

DEC 1977

digital

MADE IN USA



.REM *

IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZVTC-E-D
PRODUCT NAME: VT50A, B, H, 52 ACCEPTANCE TEST
PROGRAM DATE: APRIL 1977

MAINTAINER: DIAGNOSTIC GROUP

1. ABSTRACT

THIS PROGRAM IS AN ACCEPTANCE TEST OF THE VT50/52 VIDEO TERMINAL.
THE PROGRAM CONSISTS OF FOUR PARTS, ALL OF WHICH REQUIRE
OPERATOR INSPECTION OR INTERACTION. THE PROGRAM IS CAPABLE
OF HANDLING MULTIPLE UNITS IN A SEQUENTIAL DL-11 FASHION (REF 8.2).
****
ONLY ONE VT50/52 IS TESTED AT ONE TIME.
****
THE PROGRAM WILL DEFAULT TO THE CONSOLE TTY (REF 5.0 AND 8.2).
ALL CHARACTERS AND COMMANDS ARE TESTED. IN THE KEYBOARD CHARACTER
TEST THE FOLLOWING "FUNCTION" KEYS ARE NOT TESTED:
BREAK, REPEAT, AUTO-PRINT, AND SCROLL.

PART 1 CONSISTS OF A SERIES OF TEST PATTERNS DISPLAYED ON THE
VT50/52 SCREEN AND COPIER (REF 9, FOR DESCRIPTION). THE OPERATOR
MUST VISUALLY INSPECT EACH TEST PATTERN FOR ERROR DETECTION.

PART 2 IS A KEYBOARD CHARACTER TEST. THIS TEST IS TO DETERMINE
THAT THE TERMINAL IS GENERATING THE EXPECTED ASCII CODES.
IN THIS TEST AN OPERATOR WILL BE REQUIRED TO FOLLOW THE
INSTRUCTIONS DISPLAYED ON THE VT50/52 SCREEN AND EXECUTE THEM.
DUE TO THE FLEXIBILITY OF DIFFERENT PROCESSORS OR OPTIONS,
PARITY BIT TESTING MUST BE SELECTED BY THE OPERATOR. THE OPERATOR
SELECTS THE TYPE OF PARITY TO BE TESTED BY SW 00-01

PART 3 IS A KEYBOARD OCTAL VALUE LOOP. WHEN A KEY IS DEPRESSED,
THE OCTAL VALUE WILL BE DISPLAYED ON THE SCREEN.
IF THE KEY DEPRESSED WAS PRINTABLE, IT WILL ALSO BE DISPLAYED
ON THE SCREEN. IF A "DEFINED" CHARACTER, A TWO LETTER EQUALIVENT
(IE. BL=BELL, ES=ESCAPE ETC.) WILL BE DISPLAYED.

PART 4 IS A KEYBOARD ECHO LOOP. WHEN A KEY IS DEPRESSED, THE
CHARACTER IS ECHOED TO THE SCREEN. NO TESTING OF THE CHARACTER
IS PERFORMED. THIS ALLOWS THE OPERATOR A 'LOCAL' MODE OF OPERATION
BETWEEN THE VT50/52 AND THE HOST COMPUTER.

2. REQUIREMENTS

2.1 EQUIPTMENT

PDP-11 FAMILY COMPUTER WITH 8K WORDS OF MEMORY
VT50A, B, H, 52 VIDEO TERMINAL CONNECTED VIA A DL-11A B TYPE
INTERFACE.

2.2 STORAGE

THIS PROGRAM USES 8K OF MEMORY.

3 LOADING PROCEDURE

PROCEDURE FOR NORMAL BINARY TAPES SHOULD BE FOLLOWED.

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

STANDARD PDP-11 FORMAT

SW 15 = 1	HALT ON ERROR
SW 14 = 1	LOOP ON TEST
SW 13 = 1	INHIBIT ERROR TYPEOUTS
SW 12 = 1	INHIBIT PROGRAM SUB-TEST DELAY
SW 11 = 1	INHIBIT COPIER TESTING
SW 10 = 1	ENABLE "SAVE COPIER PAPER" MODE
SW 08 = 1	LOOP ON TEST IN SWR <4:0>
SW 07 = 1	KEYBOARD CONTROL OF THE TEST <SW 8 AND SW 7 = 1 IS AN ERROR>

KEYBOARD CHARACTER TEST ONLY

SW02 =	1	ENABLE PARITY BIT TEST
SW00-01=	00	EVEN PARITY CHECK
SW00-01=	01	ODD PARITY CHECK
SW00-01=	10	ALWAYS A 0
SW00-01=	11	ALWAYS A 1

SPECIAL NOTE: IF THE COMPUTER UTILIZED IS A LSI 11 OR A COMPUTER WITHOUT A SWITCH REGISTER THE PROGRAM WILL UTILIZE LOCATIONS 174 AND 176 AS A "DISPLAY" REGISTER AND A "SWITCH" REGISTER RESPECTIVELY. THE OPERATOR WILL BE RESPONDSIBLE FOR THE LOADING OF THE "SWITCH" REGISTER LOCATION PRIOR TO STARTING OR RESTARTING THE PROGRAM.

4.2 STARTING ADDRESS OR ADDRESSES

200	IS THE STARTING ADDRESS OF THE ACCEPTANCE TEST
204	IS THE RESTART ADDRESS OF THE ACCEPTANCE TEST
210	IS THE STARTING ADDRESS OF THE KEYBOARD CHARACTER TEST
214	IS THE STARTING ADDRESS OF THE KEYBOARD OCTAL VALUE LOOP
220	IS THE STARTING ADDRESS OF THE KEYBOARD ECHO LOOP
224	IS THE SPECIAL STARTING ADDRESS FOR VT-50 PRODUCTION

5. OPERATING PROCEDURE

THE OPERATOR MUST INSERT THE CORRECT INFORMATION IN THE SWITCH REGISTER WHEN REQUIRED BY THE PROGRAM OR AN ERROR WILL OCCUR. ONCE STARTED, THE TEST WILL RUN IN ITS NORMAL MANNER WITHOUT OPERATOR INTERVENTION OR SWITCH CHANGES.

THIS PROGRAM ALLOWS THE OPERATOR TWO MODES OF TEST PATTERN SELECTION. THESE MODES ARE SELECTED BY THE STATE OF SW 07 AT THE BEGINNING OF THE PROGRAM. WHEN SW 07 IS A ZERO, THE PROGRAM IS UNDER SWITCH REGISTER CONTROL FOR TEST PATTERN SELECTION. IF SW07 IS EQUAL TO A ONE, THE PROGRAM IS UNDER KEYBOARD CONTROL OF THE TEST PATTERN SELECTION. IN THIS MODE THE OPERATOR WILL BE REQUIRED TO TYPE IN ON THE CONSOLE TTY THE FIRST AND LAST OCTAL BASE ADDRESS OF THE DL-11'S TO WHICH VT-50'S ARE CONNECTED.

IN THE KEYBOARD SELECT MODE, TWO CHARACTERS ARE USED TO SELECT THE "STARTING WITH" OR "LOOPING ON" A PATICULAR TEST PATTERN BY "/" OR "\" RESPECTFULY.

THE "/" KEY IS USED TO SUSPEND THE CURRENT TEST AND ASK THE OPERATOR A WHICH TEST PATTERN HE/SHE WISHES TO START. THE OPERATOR NOW DEPRESSES THE LETTER WHICH REPRESENTS THE TEST PATTERN TO BE STARTED WITH. REFER TO THE PROGRAM LISTING TABLE OF CONTENTS FOR THE TEST LETTER OF EACH PATTERN.

THE "\" KEY IS USED TO SUSPEND THE CURRENT TEST AND ASK THE OPERATOR WHICH TEST PATTERN HE/SHE WISHES TO LOOP ON. THE OPERATOR NOW DEPRESSES THE LETTER OF THE TEST TO LOOP ON.

IF DURING THE EXECUTION OF A TEST PATTERN, A KEY IS DEPRESSED AND SW 07 EQUALS A ZERO, AN ERROR WILL BE REPORTED TO THE CONSOLE TTY. IF SW 07 EQUALS A ONE, AND THE CHARACTER RECEIVED WAS NOT A "/" OR "\", AN ERROR WILL BE REPORTED. THE CODES "X-OFF" AND "X-ON" ARE THE ONLY EXCEPTIONS.

6. ERRORS

THIS PROGRAM USES THE DIAGNOSTIC 'SYSMAC' PACKAGE FOR
ERROR REPORTING AND TYPEOUT. REFER TO THE "ERROR POINTER TABLE"
FOR TYPE AND DESCRIPTION OF ERRORS.
THE ERROR INFORMATION CONSISTS OF THE FOLLOWING:

ERRPC - LOCATION AT WHICH AN ERROR WAS DETECTED
VTNOW - CURRENT DL-11 BUS ADDRESS OF VT50/52 UNDER TEST
TSTNUM- TEST PATTERN NUMBER OF FAILING TEST
EXPT - EXPECTED INPUT CHARACTER
RCVD - RECEIVED INPUT CHARACTER

7. RESTRICTIONS

A. THE OPERATOR SHOULD SET SW 15 AND 13 IF THE VT50/52 UNDER TEST
   IS THE CONSOLE TTY.

B. ONLY ONE VT50/52 CAN BE TESTED AT ONE TIME.

C. THE FIRST TIME AFTER LOADING THE PROGRAM, THE TERMINAL IDENTIFIER
   MUST BE RUN.

8. MISCELLANEOUS

8.1 EXECUTION TIME

EXECUTION TIME WILL VARY WITH THE "BAUD" RATE. AND IF A COPIER IS CONNEC
THE PROGRAM WILL TYPE 'END PASS' ON THE CONSOLE WHEN A PASS HAS BEEN COM
THE KEYBOARD LOOP AND CHARACTER TEST WILL NOT EXIT UNTIL
THE PROGRAM IS RESTARTED.

8.2 DEVICE ADDRESS PROGRAM LOCATIONS (AT APPROX. 1240)

THE LOCATION "FIRST" CONTAINS THE FIRST DL11 ADDRESS IF SEVERAL VT-50'S
ARE BEING TESTED. THE DEFAULT IS THE CONSOLE ADDRESS (177560)
THE LOCATION "LAST" CONTAINS THE LAST DL11 ADDRESS IF SEVERAL VT-50'S
ARE BEING TESTED. LOCATION VTNOW CONTAINS THE CURRENT DL11 BASE ADDRESS.

*NOTE: IF THESE LOCATIONS ARE CHANGED, THE OPERATOR MUST START
THE TEST AGAIN AT LOC. 200. THE PROGRAM WILL USE THE BASE
ADDRESS TO UPDATE THE ACTUAL PROGRAM VALUES.

8.3 COPIER SAVE PAPER SWITCH

IF SW 10 = 1 AND A COPIER IS INSTALLED, THE COPIER TESTS
WILL BE EXECUTED ON THE FIRST PASS AND THEN BYPASSED FOR
THE NEXT TEN PASSES. THIS REDUCES PAPER USAGE WHEN THE
PROGRAM IS RUN FOR AN EXTENDED PERIOD. (LOC. PTCT IS # OF PASSES

9. PROGRAM DESCRIPTION (SCREEN)

9.1 A TERMINAL IDENTIFICATION TEST

THIS TEST WILL INTERROGATE THE VT50/52 UNDER TEST AS TO IT'S TYPE.
THE RESPONSE RECIEVED IS USED TO DETERMINE THE MODES TO BE TESTED
(IE. COPIER, 12/24 LINES, D.C.A (DIRECT CURSOR ADDRESSING), ETC.,
IF AN UNDEFINED OR AN INCORRECT RESPONSE IS RECIEVED, THE PROGRAM
ASSUMES VT50A MODEL (IE. 12 LINES, NO COPIER, NO D.C.A., NO EXTRA KEYPAD

9.2 B FULL SCREEN OF THE LETTER E

THIS TEST WILL FILL THE SCREEN WITH THE LETTER E.
THIS TEST WILL LOAD THE SCREEN RAM WITH A SINGLE
CHARACTER IN ALL LOCATIONS

9.3 C DATA PATH AND RAM NOISE TEST

THIS TEST WILL PRODUCE TWO FULL SCREENS OF A WORST CASE
NOISE PATTERN FOR THE SCREEN RAM AND THE DATA PATH
ALTERNATING LINES OF THE FOLLOWING
PATTERNS SHOULD BE DISPLAYED.

```
*U*U*U*U*U*U        CODES 52 AND 125
a'a'a'a'a'a'        CODES 77 AND 100
*U*U*U*U*U*U
a'a'a'a'a'a'
```

9.4 D SIMPLE CHARACTER SET

ONE FULL LINE OF EACH CHARACTER
(CODES 40 THRU 137) OF THE CHARACTER
SET. THIS WILL ALSO TEST THAT ALL WORDS
IN THE SCREEN RAM CAN BE LOADED.
THIS WILL ALSO EXERCISE THE SCROLLING FUNCTION.

IE: AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
     BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
     CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
     DDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD

9.5 E INCREMENTING AND SLIDING CHARACTER SET

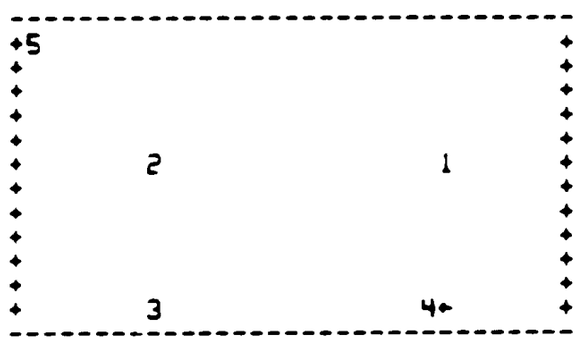
ONE FULL LINE OF AN INCREMENTING
CHARACTER SET ACROSS THE FULL SCREEN
STARTING WITH THE CODE 40 (SPACE)
THE NEXT LINE SHOULD BEGIN WITH THE
"!" CHARACTER (CODE 41) ETC. CONTINUE
THE PATTERN BY INCREMENTING THE
FIRST COLUMN CHARACTER UNTIL THE
FULL CHARACTER SET HAS BEEN EXHAUSTED.

```
                                THIS PATTERN WILL VERIFY THAT THE FULL
                                CHARACTER SET CAN BE DISPLAYED IN EACH
                                SCREEN WORD.
```

9.6 F CURSOR MOTION

IN THIS TEST THE BASIC CURSOR MOTIONS ARE
TESTED. THE FOLLOWING TEST PATTERN
IS GENERATED TO TEST THE CURSOR FUNCTIONS

BEFORE



UPON COMPLETION OF THE SETUP THE
BLINKING CURSOR WILL BE TO THE RIGHT
OF #4.

TO TEST "CURSOR UP": GENERATE CURSOR UP 6/12 TIMES AND
DISPLAY A "X"

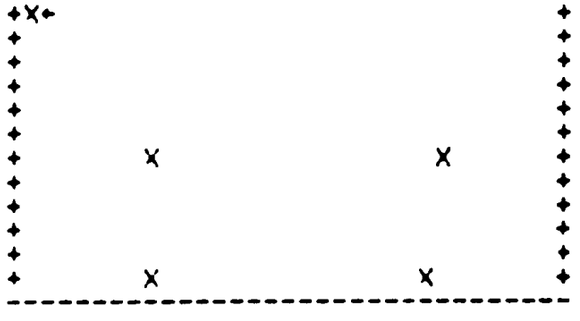
TO TEST "CURSOR LEFT": GENERATE CURSOR LEFT (BACKSPACE)
FOURTY FOUR TIMES AND DISPLAY A "X"

TO TEST "CURSOR DOWN": GENERATE CURSOR DOWN 6/12 TIMES AND
DISPLAY A "X"

TO TEST "CURSOR RIGHT": GENERATE CURSOR RIGHT FOURTY TWO TIMES AND
DISPLAY A "X"

TO TEST "CURSOR HOME": GENERATE CURSOR HOME AND DISPLAY A "X"

AFTER



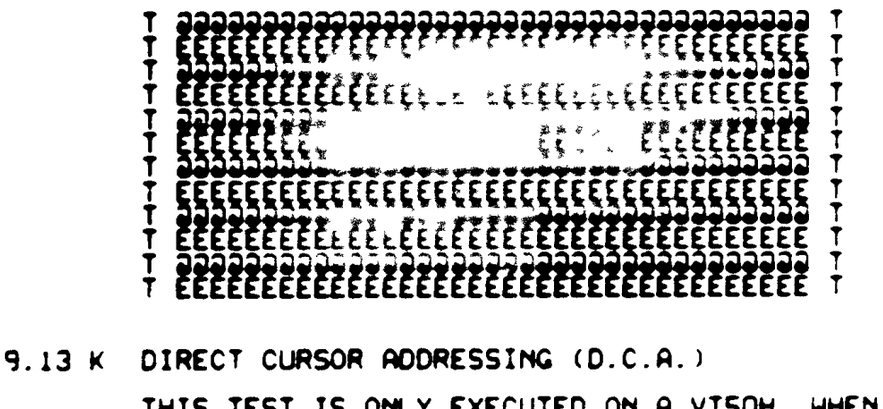
```
9.7   G   TAB, BACKSPACE AND BELL TEST

          THIS PATTERN WILL TEST THAT THE 'TAB' FUNCTIONS CORRECTLY FROM EACH
          COLUMN POSITION. GENERATE A REFERENCE LINE USING SPACES
          AND THE LETTER 'I'.   ON THE NEXT LINE
          RING THE BELL AND DISPLAY ONE CHARACTER IN COLUMN ONE AND EXECUTE A 'TAB
          THE CURSOR SHOULD THEN BE POSITIONED BELOW THE REFERENCE TAB STOP.
          REPEAT THE ONE CHARACTER IN THE FIRST TAB COLUMN ACROSS THE SCREEN.
          ON THE NEXT LINES USE INCREASING NUMBERS OF CHARACTERS BEFORE THE 'TAB'
          THE BELL WILL RING AT THE BEGINNING OF EACH LINE. THE SECOND SECTION TES
          THE BACKSPACE CODE. A FULL LINE OF THE CHARACTER "X" WILL BE DISPLAYED
          STARTING AT THE RIGHT EDGE AND EXTENDING TO THE LEFT.


          ------------------------------------------------------------------------
         +I       I       I       I       I       I       I       I       I
         +I       I       I       I       I       I       I       I       I
         +IA      IA      IA      IA      IA      IA      IA      IA      IA
         +IAA     IAA     IAA     IAA     IAA     IAA     IAA     IAA     IAA
         +IAAA    IAAA    IAAA    IAAA    IAAA    IAAA    IAAA    IAAA    IAAA
         +IAAAA   IAAAA   IAAAA   IAAAA   IAAAA   IAAAA   IAAAA   IAAAA   IAAAA
         +IAAAAA  IAAAAA  IAAAAA  IAAAAA  IAAAAA  IAAAAA  IAAAAA  IAAAAA  IAAAAA
         +IAAAAAA IAAAAAA IAAAAAA IAAAAAA IAAAAAA IAAAAAA IAAAAAA IAAAAAA IAAAAAA


          XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX


9.10 H    ERASE FROM CURSOR TO END OF LINE.

     H.1  GENERATE A FULL SCREEN OF THE CHARACTER "E"
     H.2  EXECUTE A "CURSOR HOME"
     H.3  EXECUTE "ERASE FROM CURSOR TO END OF LINE"
     H.4  EXECUTE "CURSOR RIGHT" 6/3 TIMES
     H.5  EXECUTE "LF"
          REPEAT H.3 THRU H.5 12/24 TIMES
          THE END DISPLAY SHOULD APPEAR TO BE A
          STAIR STEP PATTERN


          EEEEEE
          EEEEEEEEEEEE
          EEEEEEEEEEEEEEEEEE
          EEEEEEEEEEEEEEEEEEEEEEEE
          EEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
          EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
          EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
          EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
          EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
          EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
          EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
```

9.11 I ERASE FROM CURSOR TO END OF THE SCREEN:

GENERATE A FULL SCREEN OF THE CHARACTER "E"
EXECUTE FOURTY "CURSORS LEFT"
EXECUTE "ERASE SCREEN" AND "CURSOR UP"
REPEAT THIS 12 OR 24 TIMES. UPON COMPLETION THE PATTERN WILL
BE A LINE OF FOURTY CHARACTERS AT THE TOP LEFT OF THE SCREEN.

9.12 J VIDEO COUPLING:

THIS PATTERN WILL ALLOW FOR THE CHECKING OF VIDEO
COUPLING BETWEEN THE VIDEO AND VERTICAL CIRCUITS.
IF COUPLING OCCURS, THE VERTICAL DOTS OF THE CHARACTERS
WILL BE UNEVENLY SPACED OR DOTS WILL SPARKLE.



9.13 K DIRECT CURSOR ADDRESSING (D.C.A.)

THIS TEST IS ONLY EXECUTED ON A VT50H. WHEN EXECUTED ON A VT50H
THIS TEST WILL BE RUN TWO TIMES. THE FIRST TIME WILL BE WITH
AN "ESC-Y" AND THE SECOND WITH AN "CODE 16".
IF AN INCORRECT I.D., THIS TEST WILL NOT BE EXECUTED.
THIS TEST WILL RANDOMLY FILL THE SCREEN. THE END RESULT
WILL BE THE SAME STATEMENT ON ALL VERTICAL LINES.
EACH OF THE LINES SHOULD APPEAR THE SAME.

9.14 L HOLD SCREEN TEST

NOT EXECUTED IF VT50/52 PRODUCTION STARTING ADDRESS.
THIS TEST DETERMINES THAT THE "XON-XOFF" FEATURE IS FUNCTIONING.
A FULL SCREEN SCROLL IS EXECUTED AND A SUB-TEST TITLE
WILL BE DISPLAYED. THE HOLD SCREEN MODE IS ENABLED AND
THE PROGRAM WILL ATTEMP TO SCROLL THE SCREEN AGAIN AND SEND A MESSAGE.
THIS WILL CAUSE AN "X-OFF" TO BE SENT AND THE SCREEN IS
INHIBITED FROM SCROLLING. ANY ADDITIONAL CHARACTERS RECEIVED
WILL BE PLACED INTO THE SILO STORAGE BUFFER. UPON RECEIPT
OF AN "X-OFF", THE PROGRAM WILL DISABLE HOLD SCREEN MODE AND
SHOULD RECEIVE AN "X-ON". TO CHECK PROPER SILO OPERATION,
THE MESSAGE "TESTING SILO REG" SHOULD APPEAR UNDER THE SUB-TEST TITLE
FOLLOWED BY "SILO TEST DONE" ON THE NEXT LINE.

COPIER TEST PATTERNS

THE TEST PATTERNS USED TO TEST THE COPIER ARE THE SAME PATTERNS
AS SOME OF THE SCREEN TESTS. TWO ADDITIONAL PATTERNS HAVE
BEEN INCLUDED.

9.15 M GRAPHICS MODE/REVERSE LINE FEED TEST

THIS TEST IS EXECUTED ONLY IF UNIT IS A VT52.
GRAPHICS MODE IS ENTERED AND 37 LINES OF GRAPHICS
CHARACTERS(LINE LENGTH IS DECREMENTED BY ONE CHAR. AFTER
A LINE IS PRINTED)ARE GENERATED. THE BOTTOM LINE OF THE
WILL FORM A COMPLETE SERIES OF GRAPHIC CHARACTERS WHICH
CAN BE VERIFIED FOR ACCURACY.
IF REVERSE LINE FEED IS NOT OPERATIONAL A SINGLE
LINE OF GRAPHICS CHARACTERS WILL BE GENERATED
ON LINE 0 ONLY.

9.16 N COPIER - AUTO COPY MODE

THIS TEST IS USED TO DETERMINE IF THE AUTO COPY MODE IS FUNCTIONING CORR
THE SUB-TEST TITLE AND A ROW OF THE LETTER 'E' WILL BE DISPLAYED.
THE AUTO-COPY MODE IS ENABLED. THE COPIER SHOULD THEN START.
A PROGRAM DELAY IS EXECUTED BETWEEN EACH LINE. THE RESULT
IS THE COPIER SHOULD COPY ONE LINE AND THEN STOP FOR THE PROGRAM
DELAY TIME. WHEN THE PROGRAM DELAY IS COMPLETED ANOTHER LINE
OF 'E'S WILL BE DISPLAYED AND THE COPIER SHOULD START AGAIN.
UPON COMPLETION OF THE 12 OR 24 LINES, DISABLE AUTO-COPY MODE
IS SENT TO THE VT50. IF THE AUTO COPY MODE IS NOT DISABLED
THE NEXT SUB-TEST WOULD PERFORM IN A SIMILAR MANNER.

9.17 O COPIER - FULL SCREEN OF THE LETTER E

SAME AS SCREEN PATTERN

9.20 P COPIER - DATA PATH TEST PATTERN

SAME AS SCREEN PATTERN

9.21 Q COPIER - SINGLE CHARACTER PER LINE

SAME AS SCREEN PATTERN

9.22 R COPIER - ROTATING CHARACTER TEST

SAME AS SCREEN PATTERN

9.23 S COPIER - PERIMETER TEST

THIS TEST COPIES THE PERIMETER OF THE SCREEN AND THE
RESULTING PICTURE SHOULD RESEMBLE BELOW

9.24 T COPIER - DISCLAIMER STATEMENT

IN THIS TEST THE DISCLAMER STATEMENT FROM THE COVER PAGE
OF THIS DOCUMENT IS DISPLAYED ON THE SCREEN AND THEN COPIED.
THE COPIED VERSION SHOULD BE COMPARED TO THE FRONT COVER TO
CHECK FOR ERRORS.

9.25 U PRINTER CONTROLLER MODE TEST

A 'ROLLING' PATTERN OF INCREMENTING CHARACTERS IS
ISSUED TO THE UNIT AFTER PRINTER CONTROLLER
MODE HAS BEEN ENTERED. 92 LINES(OF 132 CHAR. EACH)
SHOULD BE PRINTED WITH NO DATA APPERING ON SCREEN.

9.26 V PRINT SCREEN TEST

THE SCREEN IS FILLED WITH 24 LINES OF 'E'S. THE
PRINT SCREEN ESCAPE SEQUENCE IS THE ISSUED AND ALL
24 LINES SHOULD BE PRINTED.

9.27 W AUTO PRINT TEST

OPERATION IS SAME AS AUTO COPY TEST EXCEPT THAT
THE PRINTER,RATHER THAN THE COPIER IS THE DESTINATION.

```
579
580
581
582
583                     9.30 X  KEYBOARD CHARACTER TEST
584
585                             THIS TEST IS DESIGNED TO VERIFY THAT CORRECT CHARACTER CODES
586                             AND PARITY BIT ARE GENERATED WHEN A KEY IS DEPRESSED.
587                             THIS TEST REQUIRES THE OPERATOR TO EXECUTE THE
588                             INSTRUCTIONS DISPLAYED ON THE SCREEN. THE OPERATOR SHOULD
589                             ONLY DEPRESS ONE KEY AT A TIME, WITH SOME EXCEPTIONS.
590                             THE OPERATOR WILL BE REQUIRED TO SKIP THOSE KEYS THAT
591                             ARE NOT IMPLEMENTED IF THE UNIT IS A VT50. THE PROGRAM WILL
592                             INFORM THE OPERATOR WHICH ROW TO TEST.
593
594                             IN TESTING THE PARITY BIT, SW 0 AND 1 ARE USED TO
595                             INFORM THE PROGRAM OF THE EXPECTED PARITY. AN INCORRECT
596                             SWITCH SETTING WILL RESULT IN AN ERROR.
597
598
599                     9.31 Y  KEYBOARD OCTAL VALUE LOOP
600
601                             THIS LOOP IS PROVIDED TO ENABLE THE OPERATOR
602                             TO EXAMINE THE OCTAL VALUE OF A CHARACTER. WHEN A KEY IS
603                             DEPRESSED, THE OCTAL VALUE WILL BE DISPLAYED.
604                             IF THE CHARACTER WAS A PRINTABLE CHARACTER, IT WILL BE DISPLAYED.
605                             THOSE CODES DEFINED AS "CONTROL" WILL BE DISPLAYED AS A
606                             TWO LETTER MNEMONIC (IE. DE=DELETE, BL=BELL, CL=CURSOR LEFT ETC.)
607
608                     9.32 Z  KEYBOARD ECHO LOOP
609
610                             WHEN A KEY IS DEPRESSED, THE CHARACTER WILL BE DISPLAYED.
611                             NO MODIFICATION OR DATA TEST IS PERFORMED. THIS TEST CAN
612                             BE USED TO DETERMINE IF THERE IS A "UART" OR SERIAL
613                             LINE PROBLEM. WHEN THE VT50/52 IS IN LOCAL MODE (NO UART/SERIAL LINE)
614                             THE CHARACTERS SHOULD BE ECHOED CORRECTLY. IF NOT, THE PROBLEM
615                             IS IN THE VT50 UNIT. IF CHANGED TO REMOTE
616                             MODE AND THE CHARACTERS ARE IN ERROR, THERE IS A UART/
617                             SERIAL LINE PROBLEM.
618
```

```
                        .TITLE  MAINDEC-11-DZVTC-E
                        ;*COPYRIGHT (C) 1977
                        ;*DIGITAL EQUIPMENT CORP.
                        ;*MAYNARD, MASS. 01754
                        ;*
                        ;*PROGRAM BY TERMINAL DIAGNOSTICS
                        ;*
                        ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
                        ;*PACKAGE (MAINDEC-11-DZQAC-C3), JAN 19, 1977.
                        ;*
                        .SBTTL  BASIC DEFINITIONS

                        ;*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
001100                  STACK=  1100
                        .EQUIV  EMT,ERROR       ;;BASIC DEFINITION OF ERROR CALL
                        .EQUIV  TOT,SCOPE       ;;BASIC DEFINITION OF SCOPE CALL

                        ;*MISCELLANEOUS DEFINITIONS
000011                  HT=     11              ;;CODE FOR HORIZONTAL TAB
000012                  LF=     12              ;;CODE FOR LINE FEED
000015                  CR=     15              ;;CODE FOR CARRIAGE RETURN
000200                  CRLF=   200             ;;CODE FOR CARRIAGE RETURN-LINE FEED
177776                  PS=     177776          ;;PROCESSOR STATUS WORD
                        .EQUIV  PS,PSW
177774                  STKLMT= 177774          ;;STACK LIMIT REGISTER
177772                  PIRQ=   177772          ;;PROGRAM INTERRUPT REQUEST REGISTER
177570                  DSWR=   177570          ;;HARDWARE SWITCH REGISTER
177570                  DDISP=  177570          ;;HARDWARE DISPLAY REGISTER

                        ;*GENERAL PURPOSE REGISTER DEFINITIONS
000000                  R0=     %0              ;;GENERAL REGISTER
000001                  R1=     %1              ;;GENERAL REGISTER
000002                  R2=     %2              ;;GENERAL REGISTER
000003                  R3=     %3              ;;GENERAL REGISTER
000004                  R4=     %4              ;;GENERAL REGISTER
000005                  R5=     %5              ;;GENERAL REGISTER
000006                  R6=     %6              ;;GENERAL REGISTER
000007                  R7=     %7              ;;GENERAL REGISTER
000006                  SP=     %6              ;;STACK POINTER
000007                  PC=     %7              ;;PROGRAM COUNTER

                        ;*PRIORITY LEVEL DEFINITIONS
000000                  PR0=    0               ;;PRIORITY LEVEL 0
000040                  PR1=    40              ;;PRIORITY LEVEL 1
000100                  PR2=    100             ;;PRIORITY LEVEL 2
000140                  PR3=    140             ;;PRIORITY LEVEL 3
000200                  PR4=    200             ;;PRIORITY LEVEL 4
000240                  PR5=    240             ;;PRIORITY LEVEL 5
000300                  PR6=    300             ;;PRIORITY LEVEL 6
000340                  PR7=    340             ;;PRIORITY LEVEL 7

                        ;*"SWITCH REGISTER" SWITCH DEFINITIONS
100000                  SW15=   100000
040000                  SW14=   40000
020000                  SW13=   20000
010000                  SW12=   10000
```

```
                        004000          SW11=   4000
                        002000          SW10=   2000
                        001000          SW09=   1000
                        000400          SW08=   400
                        000200          SW07=   200
                        000100          SW06=   100
                        000040          SW05=   40
                        000020          SW04=   20
                        000010          SW03=   10
                        000004          SW02=   4
                        000002          SW01=   2
                        000001          SW00=   1
                                        .EQUIV  SW09,SW9
                                        .EQUIV  SW08,SW8
                                        .EQUIV  SW07,SW7
                                        .EQUIV  SW06,SW6
                                        .EQUIV  SW05,SW5
                                        .EQUIV  SW04,SW4
                                        .EQUIV  SW03,SW3
                                        .EQUIV  SW02,SW2
                                        .EQUIV  SW01,SW1
                                        .EQUIV  SW00,SW0

                                        ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
                        100000          BIT15=  100000
                        040000          BIT14=  40000
                        020000          BIT13=  20000
                        010000          BIT12=  10000
                        004000          BIT11=  4000
                        002000          BIT10=  2000
                        001000          BIT09=  1000
                        000400          BIT08=  400
                        000200          BIT07=  200
                        000100          BIT06=  100
                        000040          BIT05=  40
                        000020          BIT04=  20
                        000010          BIT03=  10
                        000004          BIT02=  4
                        000002          BIT01=  2
                        000001          BIT00=  1
                                        .EQUIV  BIT09,BIT9
                                        .EQUIV  BIT08,BIT8
                                        .EQUIV  BIT07,BIT7
                                        .EQUIV  BIT06,BIT6
                                        .EQUIV  BIT05,BIT5
                                        .EQUIV  BIT04,BIT4
                                        .EQUIV  BIT03,BIT3
                                        .EQUIV  BIT02,BIT2
                                        .EQUIV  BIT01,BIT1
                                        .EQUIV  BIT00,BIT0

                                        ;*BASIC "CPU" TRAP VECTOR ADDRESSES
                        000004          ERRVEC= 4               ;;TIME OUT AND OTHER ERRORS
                        000010          RESVEC= 10              ;;RESERVED AND ILLEGAL INSTRUCTIONS
                        000014          TBITVEC=14              ;;"T" BIT
                        000014          TRTVEC= 14              ;;TRACE TRAP
```

```
                000014                  BPTVEC= 14              ;;BREAKPOINT TRAP (BPT)
                000020                  IOTVEC= 20              ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
                000024                  PWRVEC= 24              ;;POWER FAIL
                000030                  EMTVEC= 30              ;;EMULATOR TRAP (EMT) **ERROR**
                000034                  TRAPVEC=34              ;;"TRAP" TRAP
                000060                  TKVEC=  60              ;;TTY KEYBOARD VECTOR
                000064                  TPVEC=  64              ;;TTY PRINTER VECTOR
                000240                  PIRQVEC=240             ;;PROGRAM INTERRUPT REQUEST VECTOR
  632
  633                                   .SBTTL  OPERATIONAL SWITCH SETTINGS
                                        ;*
                                        ;*      SWITCH                  USE
                                        ;*      ------                  ---
                                        ;*        15                    HALT ON ERROR
                                        ;*        14                    LOOP ON TEST
                                        ;*        13                    INHIBIT ERROR TYPEOUTS
                                        ;*        12                    INHIBIT SUB-TEST DELAY'S
                                        ;*        10                    ENABLE SAVE COPIER PAPER MODE
                                        ;*         8                    LOOP ON TEST IN SWR<7:0>
  634                                   .SBTTL  TRAP CATCHER

                000000                          .=0
                                        ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
                                        ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
                                        ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
                000174                          .=174
  000174  000000                       DISPREG:  .WORD  0              ;;SOFTWARE DISPLAY REGISTER
  000176  000000                       SWREG:    .WORD  0              ;;SOFTWARE SWITCH REGISTER
                                        .SBTTL  STARTING ADDRESS(ES)
  000200  000137  001334                        JMP     @#BEGIN ;;JUMP TO STARTING ADDRESS OF PROGRAM
  635   000204  000137  001364                 JMP     RBEGIN          ;JUMP TO RESTART ADDRESS
  636   000210  000137  001410                 JMP     BEGIN1          ;JUMP TO KEYBOARD CHARACTER TEST
  637   000214  000137  001420                 JMP     BEGIN2          ;JUMP TO CHAR OCTAL VALUE LOOP
  638   000220  000137  001400                 JMP     BEGIN3          ;JUMP TO ASCII ECHO LOOP
  639   000224  000137  001360                 JMP     MANFU           ;JUMP TO W.F. SPECIAL TEST PARAM
```

```
                        .SBTTL  COMMON TAGS

                        ;;**********************************************************************
                        ;*THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
                        ;*USED IN THE PROGRAM.

                001100          .=1100
001100                  $CMTAG:                 ;;START OF COMMON TAGS
001100  000000          $PASS:  .WORD   0       ;;CONTAINS PASS COUNT
001102  000             $TSTNM: .BYTE   0       ;;CONTAINS THE TEST NUMBER
001103  000             $ERFLG: .BYTE   0       ;;CONTAINS ERROR FLAG
001104  000000          $ICNT:  .WORD   0       ;;CONTAINS SUBTEST ITERATION COUNT
001106  000000          $LPADR: .WORD   0       ;;CONTAINS SCOPE LOOP ADDRESS
001110  000000          $LPERR: .WORD   0       ;;CONTAINS SCOPE RETURN FOR ERRORS
001112  000000          $ERTTL: .WORD   0       ;;CONTAINS TOTAL ERRORS DETECTED
001114  000             $ITEMB: .BYTE   0       ;;CONTAINS ITEM CONTROL BYTE
001115  001             $ERMAX: .BYTE   1       ;;CONTAINS MAX. ERRORS PER TEST
001116  000000          $ERRPC: .WORD   0       ;;CONTAINS PC OF LAST ERROR INSTRUCTION
001120  000000          $GDADR: .WORD   0       ;;CONTAINS ADDRESS OF 'GOOD' DATA
001122  000000          $BDADR: .WORD   0       ;;CONTAINS ADDRESS OF 'BAD' DATA
001124  000000          $GDDAT: .WORD   0       ;;CONTAINS 'GOOD' DATA
001126  000000          $BDDAT: .WORD   0       ;;CONTAINS 'BAD' DATA
001130  000000                  .WORD   0       ;;RESERVED--NOT TO BE USED
001132  000000                  .WORD   0
001134  000             $AUTOB: .BYTE   0       ;;AUTOMATIC MODE INDICATOR
001135  000             $INTAG: .BYTE   0       ;;INTERRUPT MODE INDICATOR
001136  000000                  .WORD   0
001140  177570          $SWR:   .WORD   DSWR    ;;ADDRESS OF SWITCH REGISTER
001142  177570          DISPLAY: .WORD  DDISP   ;;ADDRESS OF DISPLAY REGISTER
001144  177560          $TKS:   177560          ;;TTY KBD STATUS
001146  177562          $TKB:   177562          ;;TTY KBD BUFFER
001150  177564          $TPS:   177564          ;;TTY PRINTER STATUS REG. ADDRESS
001152  177566          $TPB:   177566          ;;TTY PRINTER BUFFER REG. ADDRESS
001154  000             $NULL:  .BYTE   0       ;;CONTAINS NULL CHARACTER FOR FILLS
001155  002             $FILLS: .BYTE   2       ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
001156  012             $FILLC: .BYTE   12      ;;INSERT FILL CHARS. AFTER A "LINE FEED"
001157  000             $TPFLG: .BYTE   0       ;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES,
001160  000000          $REGAD: .WORD   0       ;;CONTAINS THE ADDRESS FROM
                                                ;;WHICH  ($REGO) WAS OBTAINED
001162  000000          $REGO:  .WORD   0       ;;CONTAINS (($REGAD)+0)
001164  000000          $REG1:  .WORD   0       ;;CONTAINS (($REGAD)+2)
001166  077             $QUES:  .ASCII  /?/     ;;QUESTION MARK
001167  015             $CRLF:  .ASCII  <15>    ;;CARRIAGE RETURN
001170  000012          $LF:    .ASCIZ  <12>    ;;LINE FEED

                        ;;**********************************************************************
```

```
                                .SBTTL  ERROR POINTER TABLE

                                ;*THIS TABLE CONTAINS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.
                                ;*THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN
                                ;*LOCATION $ITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
                                ;*NOTE1:        IF $ITEMB IS 0 THE ONLY PERTINENT DATA IS ($ERRPC).
                                ;*NOTE2:      EACH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:

                                ;*      EM              ;;POINTS TO THE ERROR MESSAGE
                                ;*      DH              ;;POINTS TO THE DATA HEADER
                                ;*      DT              ;;POINTS TO THE DATA
                                ;*      DF              ;;POINTS TO THE DATA FORMAT

001172                          $ERRTB:

                                ;ITEM   1
001172  020345                          EM1             ;ERROR FLAG ON HOST TRANSMIT STATUS
001174  020570                          DH1             ;ERRPC  VTNOW   TSTNUM
001176  020734                          DT1             ;$ERRPC VTNOW   TSTNUM
001200  000000                          0

                                ;ITEM   2
001202  020412                          EM2             ;NO HOST INPUT FLAG RECEIVED
001204  020570                          DH1             ;ERRPC  VTNOW   TSTNUM
001206  020734                          DT1             ;$ERRPC VTNOW   TSTNUM
001210  000000                          0

                                ;ITEM   3
001212  020441                          EM3             ;INCORRECT I.D. RESPONSE
001214  020617                          DH3             ;ERRPC  VTNOW   1ST WD  2ND WD  3RD WD
001216  020744                          DT3             ;$ERRPC VTNOW   SAVE4   SAVE2   SAVE3
001220  000000                          0

                                ;ITEM   4
001222  020465                          EM4             ;INCORRECT OR UNEXPECTED INPUT CHARACTER
001224  020666                          DH4             ;ERRPC  VTNOW   TSTNUM  EXPT    RCVD
001226  020760                          DT4             ;$ERRPC VTNOW   TSTNUM  $GDDAT $BDDAT
001230  000000                          0

                                ;ITEM   5
001232  020530                          EM5             ;INVALID BUSS ADDRESS, TRY AGAIN
001234  000000                          0
001236  000000                          0
001240  000000                          0
001242  177560          FIRST:  177560                  ;FIRST DEVICE ADDRESS OF SEQUIENTAL DL-11-A/B TYPE DEVIC
                                                        ;DEFAULT TO THE CONSOLE ADDRESS
001244  000000          LAST:   0                       ;LAST DEVICE ADDRESS OF DL-11-A/B TYPE
001246  177560          VTNOW:  177560                  ;CURRENT DEVICE BUSS ADDRESS
001250  100011          PTCT:   100011                  ;COPIER PAPER SAVE COUNT (LOW BYTE
001252  000000          TSTNUM: 0                       ;ERROR PATTERN

001254  000300          TIMEO:  300                     ;CHARACTER FLAG TIMEOUT CONSTANT
001256  000005          SUBTST: 5                       ;SUBTEST DELAY CONSTANT
001260  000000          V*5**:  0                       ;I.D. AND CHARASTICS
```

```
                                LASTLN: 53          ;OR 67          ;LAST VALID LINE # +40
                                TOTALC: 960.        ;OR 1920.       ;TOTAL CHARACTER COUNT
                                VH0:    12.         ;24.            ;VERTICAL LINE COUNT
                                VH1:    6.          ;12.            ;1/2 VERTICAL LINE COUNT
                                VH2:    3.          ;6.             ;1/4 VERTICAL LINE COUNT
                                PRTCNT: 0
                                VTIS:   177560                      ;DEVICE ADDRESSES
                                VTIB:   177562                      ;IN DATA
                                VTOS:   177564                      ;OUT STAT
                                VTOB:   177566                      ;OUT DATA
                                STCHAR: 0                           ;TEMP REG'S
                                LASTCH: 140         ;OR 200         ;FIRST NON-VALID CHARACTER
                                TEMP:   0                           ;TEMP REG'S
                                TEMP0:  0                           ;
                                PNTWID: 132.                        ;COLUMN COUNT FOR LINE PRINTER.
                                WIDTH:  80.                         ;COLUMN WIDTH
                                SAVE1:  0                           ;TEMP REG'S
                                SAVE2:  0
                                SAVE3:  0
                                SAVE4:  0
                                WFTEST: 0                           ;NON-ZERO IF SA = 224


001334  012737  002466  002402  BEGIN:  MOV     #TST2,WHERE        ;STARTING ACCEPTANCE TEST ADDRESS
001342  005037  001330          CLR     SAVE4
001346  005037  001332          CLR     WFTEST
001352  005037  001274          CLR     PRTCNT
001356  000426                  BR      GINA
001360  005237  001332  MANFU:  INC     WFTEST              ;SET W.F. PARAM.
001364  005037  001274  RBEGIN: CLR     PRTCNT              ;RESTART ADDRESS
001370  012737  002466  002402  MOV     #TST2,WHERE
001376  000413                  BR      GIN
001400  012737  010100  002402  BEGIN3: MOV     #KRBECH,WHERE      ;START AT ECHO LOOP
001406  000407                  BR      GIN
001410  012737  007404  002402  BEGIN1: MOV     #KRBTST,WHERE      ;STARTING CHARACTER TEST ADDRESS
001416  000403                  BR      GIN
001420  012737  007110  002402  BEGIN2: MOV     #KRBECO,WHERE      ;STARTING CHARACTER LOOP ADDRESS
001426  012737  000001  001330  GIN:    MOV     #1,SAVE4
001434  000005                  GINA:   RESET
                                .SBTTL  INITIALIZE THE COMMON TAGS
(1)                             ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
(1)     001436  012706  001100          MOV     #$CMTAG,R6         ;;FIRST LOCATION TO BE CLEARED
(1)     001442  005026                   CLR     (R6)+              ;;CLEAR MEMORY LOCATION
(1)     001444  022706  001140          CMP     #$WR,R6 ;;DONE?
(1)     001450  001374                   BNE     .-6                ;;LOOP BACK IF NO
(1)     001452  012706  001100          MOV     #STACK,SP          ;;SETUP THE STACK POINTER
(1)                             ;;INITIALIZE A FEW VECTORS
(1)     001456  012737  023624  000020  MOV     #$SCOPE,@#IOTVEC   ;;IOT VECTOR FOR SCOPE ROUTINE
(1)     001464  012737  000340  000022  MOV     #340,@#IOTVEC+2    ;;LEVEL 7
(1)     001472  012737  023742  000030  MOV     #$ERROR,@#EMTVEC   ;;EMT VECTOR FOR ERROR ROUTINE
(1)     001500  012737  000340  000032  MOV     #340,@#EMTVEC+2    ;;LEVEL 7
(1)     001506  012737  024760  000034  MOV     #$TRAP,@#TRAPVEC   ;;TRAP VECTOR FOR TRAP CALLS
(1)     001514  012737  000340  000036  MOV     #340,@#TRAPVEC+2   ;LEVEL 7
(1)     001522  012737  025036  000024  MOV     #$PWRDN,@#PWRVEC   ;;POWER FAILURE VECTOR
(1)     001530  012737  000340  000026  MOV     #340,@#PWRVEC+2    ;;LEVEL 7
(1)     001536  013737  006762  006754  MOV     $ENDCT,$EOPCT      ;;SETUP END-OF-PROGRAM COUNTER
```

```
(1)  001544  012737  001544  001106          MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
(2)                                ;;SIZE FOR A HARDWARE SWITCH REGISTER.  IF NOT FOUND OR IT IS
(2)                                ;;EQUAL TO A "-1"  SETUP FOR A SOFTWARE SWITCH REGISTER.
(2)  001552  013746  000004                      MOV     @#ERRVEC,-(SP)  ;;SAVE ERROR VECTOR
(2)  001556  012737  001612  000004              MOV     #64$,@#ERRVEC   ;;SET UP ERROR VECTOR
(2)  001564  012737  177570  001140              MOV     #DSWR,SWR       ;;SETUP FOR A HARDWARE SWICH REGISTER
(2)  001572  012737  177570  001142              MOV     #DDISP,DISPLAY  ;;AND A HARDWARE DISPLAY REGISTER
(2)  001600  022777  177777  177332              CMP     #-1,@SWR        ;;TRY TO REFERENCE HARDWARE SWR
(2)  001606  001012                              BNE     66$             ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
(2)                                                                      ;;AND  THE HARDWARE SWR IS NOT = -1
(2)  001610  000403                              BR      65$             ;;BRANCH IF NO TIMEOUT
(2)  001612  012716  001620          64$:        MOV     #65$,(SP)       ;;SET UP FOR TRAP RETURN
(2)  001616  000002                              RTI
(2)  001620  012737  000176  001140  65$:        MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
(2)  001626  012737  000174  001142              MOV     #DISPREG,DISPLAY
(2)  001634  012637  000004          66$:        MOV     (SP)+,@#ERRVEC  ;;RESTORE ERROR VECTOR
(1)
728  001640  005037  010666                      CLR     IGNORE
729  001644  005037  010650                      CLR     LOOP
730  001650  012737  023610  000020              MOV     #MSCOPE,@#IOTVEC
731  001656  005737  001330                      TST     SAVE4           ;TEST FLAG
732  001662  001051                              BNE     SBEGIN          ;BR IF NON-ZERO
733  001664  104401                              TYPE
734  001666  013144                              TITLE
735  001670  105777  177244                      TSTB    @SWR
736  001674  100044                              BPL     SBEGIN          ;BR IF CLEARED
737  001676  012737  001776  000004              MOV     #12$,4          ;SET UP SLAVE TIMEOUT
738  001704  012737  000340  000006              MOV     #340,6          ;LOCK OUT ANY INTERRUPTS
739  001712  104401          11$:        TYPE
740  001714  020156                              WHATO                   ;FIND OUT THE DEVICE ADDRESS
741  001716  104410                              RDOCT
742  001720  012637  001242                      MOV     (SP)+,FIRST     ;SAVE THE ADDRESS
743  001724  022737  160000  001242              CMP     #160000,FIRST
744  001732  101367                              BHI     11$             ;BR IF INVALID
745  001734  005777  177302                      TST     @FIRST          ;TEST IF VALID
746  001740  005037  001244                      CLR     LAST
747  001744  104401                              TYPE
748  001746  020221                              WHAT1                   ;FIND OUT THE LAST ADDRESS
749  001750  104410                              RDOCT
750  001752  012637  001244                      MOV     (SP)+,LAST      ;SAVE LAST ADDRESS
751  001756  005777  177262                      TST     @LAST           ;TEST IF VALID
752  001762  012737  000006  000004              MOV     #6,@#4
753  001770  005037  000006                      CLR     @#6
754  001774  000404                              BR      SBEGIN
755  001776  022626          12$:        CMP     (SP)+,(SP)+     ;ADJUST STACK FROM TIMEOUT
756  002000  104401                              TYPE
757  002002  016134                              INVLID                  ;INVALID ADDRESS MESSAGE
758  002004  000742                              BR      11$             ;LET OPERATOR HAVE ANO TRY
759  002006  013737  001242  001246  SBEGIN:     MOV     FIRST,VTNOW     ;LOAD INITIAL DEVICE ADDRESS
760
761  002014  012700  001276          PSTRT:      MOV     #VTIS,R0        ;LOAD POINTER
762  002020  013701  001246                      MOV     VTNOW,R1        ;LOAD INPUT STAT
763  002024  010120                              MOV     R1,(R0)+
764  002026  005721                              TST     (R1)+
765  002030  010120                              MOV     R1,(R0)+
766  002032  005721                              TST     (R1)+
```

```
767  002034  010120                  MOV     R1,(R0)+
768  002036  005721                  TST     (R1)+
769  002040  010110                  MOV     R1,(R0)
```

```
                                ;;*****************************************************************
                                ;*TEST 1         A       TERMINAL IDENTIFICATION TEST
                                ;;*****************************************************************
002042  000004                  TST1:   SCOPE
002044  004537  011442                  JSR     R5,AMSG         ;DISPLAY HEADER
002050  013656                          M914
002052  004537  011442                  JSR     R5,AMSG         ;SEND REQUEST FOR IDENTIFICATION
002056  017551                          RFI

002060  004737  013052                  JSR     PC,GETCHR       ;GET A CHARACTER
002064  000537                          BR      2$              ;;BR BACK IF NO INPUT
002066  010037  001330                  MOV     R0,SAVE4        ;SAVE RESPONSE
002072  004737  013052                  JSR     PC,GETCHR       ;GET A CHAR.
002076  000532                          BR      2$              ;;BR IF NO INPUT
002100  010037  001324                  MOV     R0,SAVE2
002104  004737  013052                  JSR     PC,GETCHR       ;GET A CHAR.
002110  000525                          BR      2$              ;;BR IF NO INPUT
002112  010037  001326                  MOV     R0,SAVE3
002116  042737  177600  001330          BIC     #177600,SAVE4   ;MASK BIT 7
002124  042737  177600  001324          BIC     #177600,SAVE2
002132  042737  177600  001326          BIC     #177600,SAVE3
002140  005737  001332                  TST     WFTEST
002144  001402                          BEQ     10$
002146  004737  011370                  JSR     PC,ADELAY       ;EXTRA DELAY
002152  122737  000033  001330  10$:    CMPB    #33,SAVE4       ;TEST FIRST CHAR.
002160  001015                          BNE     1$              ;BR TO ERROR
002162  122737  000057  001324          CMPB    #'/,SAVE2       ;TEST SECOND CHAR.
002170  001011                          BNE     1$              ;BR TO ERROR

                                ;NOW DETERMINE WHICH VT5XX AND ITS CHARASTICS

002172  005000                          CLR     R0              ;CLEAR INITIAL POINTER
002174  126037  002404  001326  3$:     CMPB    TYPEPT(R0),SAVE3        ;TEST I.D. TO KNOWN VALUE
002202  001406                          BEQ     4$              ;BR IF CORRECT
002204  005720                          TST     (R0)+           ;BUMP THE INDEX
002206  105760  002404                  TSTB    TYPEPT(R0)      ;CHECK IF MORE VALID I.D.'S
002212  001370                          BNE     3$              ;BR IF MORE
002214  104003                  1$:     ERROR   3               ;INCORRECT I.D. CODE
002216  005000                  11$:    CLR     R0              ;DEFAULT TO VT50A MODE

                                ;HAVE NOW FOUND THE I.D. - REPORT TO CONSOLE

002220  016037  002404  001260  4$:     MOV     TYPEPT(R0),VT5XX        ;SAVE I.D. AND CHARASTICS
002226  016037  002436  002242          MOV     MSGTYP(R0),5$           ;SAVE ASCII MESSAGE POINTER
002234  001403                          BEQ     13$             ;BR IF ZERO MESSAGE POINTER
002236  004537  011442                  JSR     R5,AMSG         ;TELL THE UUT
002242  016760                  5$:     VT50A                   ;POINTER TO VT5XX MESSAGE

002244  012737  001700  001264  13$:    MOV     #960.,TOTALC    ;LOAD TOTAL CHARACTER COUNT
002252  012737  000014  001266          MOV     #12.,VHO        ;LOAD MAX VERTICAL LINE COUNT
002260  012737  000053  001262          MOV     #53,LASTLN      ;LOAD LAST LINE VALUE +40 FOR DCA TESTING
002266  005737  001260                  TST     VT5XX           ;TEST IF 24 LINES AVAIL
002272  100007                          BPL     6$              ;BR IF NOT
002274  006337  001264                  ASL     TOTALC          ;ADJUST CHARACTER COUNT
002300  006337  001266                  ASL     VHO             ;ADJUST LINE COUNT
```

```
                                ADD     #12.,LASTLN             ;ADJUST VALID LINE # +40
                        
002312  013737  001266  001270  6$:     MOV     VH0,VH1         ;LOAD OTHER LINE COUNTS
002320  006237  001270          ASR     VH1
002324  013737  001270  001272  MOV     VH1,VH2
002332  006237  001272          ASR     VH2
002336  012737  000140  001310  MOV     #140,LASTCH             ;LOAD FIRST NON-VALID CHARACTER
002344  032737  004000  001260  BIT     #BIT11,VT5XX            ;TEST IF UPPER-LOWER CASE TERM.
002352  001403                  BEQ     7$                      ;BR IF NOT
002354  062737  000037  001310  ADD     #37,LASTCH              ;UPDATE TO ALLOW UP-LW CASE CHARACTER SET
002362                  7$:
002362  000403                  BR      12$             ;;BR AND START TESTING
                        
002364  104002          2$:     ERROR   2                       ;NO RESPONSE FROM UUT ADTER ASKING FOR IDENTIFY
002366  000713                  BR      11$
002370  000240                  NOP
002372  004737  011262  12$:     JSR     PC,DELAY
002376  000177  000000          JMP     @WHERE
002402  002466          WHERE:  TST2
                        
                        ;I.D. VALUES AND CHARACTERISTICS
                        ;       BIT15 = 1       24 LINES
                        ;       BIT14 = 1       COPIER CONNECTED
                        ;       BIT13 = 1       DIRECT CURSOR ADDRESSING (ESC Y) + "ESC-B" + "ESC-D"
                        ;       BIT12 = 1       VT50H KEYPAD
                        ;       BIT11 = 1       UPPER AND LOWER CASE CHARACTERS
                        ;       BIT10 = 1       PRINTER CONNECTED
                        ;       BIT09 = 1       VT52X MODEL
                        
                        ;LOW BYTE CONTAINS THE I.D. FOR EACH KNOWN VT5??

002404  000101  TYPEPT: .WORD   000101  ;I.D. = 101      ;VT50A
002406  040102          .WORD   040102  ;I.D. = 102      ;VT50B COPIER
002410  140103          .WORD   140103  ;I.D. = 103      ;VT55 24. LINES, COPIER(VT50 BASED)
002412  070110          .WORD   070110  ;I.D. = 110      ;VT50H COPIER DCA VT50H KEYPAD
002414  135113          .WORD   135113  ;I.D. = 113      ;VT52
002416  175114          .WORD   175114  ;I.D. = =114     ;VT52 WITH COPIER
002420  137115          .WORD   137115  ;I.D. = 115      ;VT52 WITH PRINTER.
002422  175105          .WORD   175105  ;I.D. = 105      ;VT55.24LINES,WITH COPIER(VT52 BASED)
002424  000000          0
002426  000000          0
002430  000000          0
002432  000000          0
002434  000000          0
                        
                        ;ASCII MESSAGE POINTERS

002436  016760  MSGTYP: VT50A                   ;VT50A NO COPIER
002440  017032          VT50B                   ;VT50B COPIER
002442  017101          VT55                    ;VT55 COPIER
002444  017163          VT50H                   ;VT50H COPIER
002446  017241          VT52K                   ;VT52
002450  017324          VT52L                   ;VT52 WITH COPIER
002452  017405          VT52M                   ;VT52 WITH PRINTER
002454  017466          VT55E
002456  000000          0
```

```
                                0
                                0
                                0
                        ;;*******************************************************************
                        ;;*TEST 2          B       FULL SCREEN OF A CHARACTER
                        ;;*******************************************************************
(2) 002466  000004      TST2:   SCOPE

002470  004537  011442          JSR     R5,AMSG
002474  013245                  M91

002476  004737  013010          JSR     PC,FILLWC       ;FILL SCREEN WITH A 'E'S

002502  004737  011262          JSR     PC,DELAY

                        ;;*******************************************************************
                        ;;*TEST 3          C       DATA TRANSFER PATH TEST
                        ;;*******************************************************************
(2) 002506  000004      TST3:   SCOPE
002510  004537  011442          JSR     R5,AMSG         ;DISPLAY HEADING
002514  013313                  M92
002516  013737  001270  001312  MOV     VH1,TEMP        ;SET-UP A COUNTER

002524  004537  011154          JSR     R5,DTPSR        ;SET-UP BUFFER
002530  000077                  77                      ;OCTAL '?'
002532  000100                  100                     ;OCTAL '@'

002534  004537  011160          JSR     R5,DTPSRB       ;SET-UP BUFFER
002540  000125                  125                     ;OCTAL 'U'
002542  000052                  52                      ;OCTAL '*'

002544  004737  010236  1$:     JSR     PC,XPRNT        ;DISPLAY THIS LINE
002550  005337  001312          DEC     TEMP            ;COMPLETED FULL COUNT?
002554  001373                  BNE     1$              ;BRANCH IF NOT COMPLETED

002556  004737  011262          JSR     PC,DELAY        ;TEST DELAY SWITCH
                        ;;*******************************************************************
                        ;;*TEST 4          D       SINGLE CHARACTER ACROSS ALL COLS. (ALL CHARACTERS)
                        ;;*******************************************************************
(2) 002562  000004      TST4:   SCOPE
002564  004537  011442          JSR     R5,AMSG         ;DISPLAY HEADING
002570  013342                  M93
002572  012737  000040  001306  MOV     #40,STCHAR      ;SET-UP STARTING CHARACTER

002600  013737  001266  001314  MOV     VH0,TEMP0       ;LOAD COUNT
002606  013701  001306  1$:     MOV     STCHAR,R1       ;LOAD R1= TO CHARACTER
002612  004737  010134          JSR     PC,FILBUF       ;LOAD A BUFFER WITH THAT CHARACTER

002616  004737  010236          JSR     PC,XPRNT        ;DISPLAY A FULL LINE FROM THE BUFFER

002622  005337  001314          DEC     TEMP0           ;DONE ?
002626  001005                  BNE     2$              ;FINISHED
002630  004737  011262          JSR     PC,DELAY
002634  013737  001266  001314  MOV     VH0,TEMP0
002642  005237  001306  2$:     INC     STCHAR          ;UPDATE THE CHARACTER
002646  023737  001310  001306  CMP     LASTCH,STCHAR   ;TEST FOR FINAL CHARACTER
```

```
                        BNE     1$              ;BRANCH IF NOT COMPLETED

002656  004737  011262       JSR     PC,DELAY        ;TEST DELAY SWITCH

                        ;;*****************************************************************
                        ;*TEST 5         E       ROTATING CHARACTERS ACROSS ALL COLS. (ALL CHARACTERS)
                        ;;*****************************************************************
002662  000004          TST5:   SCOPE
002664  004537  011442          JSR     R5,AMSG         ;DISPLAY HEADING
002670  013404                  M94
002672  012737  000040  001306  MOV     #40,STCHAR      ;SET-UP STARTING CHARACTER

002700  013737  001266  001314  MOV     VHO,TEMPO       ;LOAD TEMP
002706  013701  001306  1$:     MOV     STCHAR,R1       ;LOAD R1=TO CHARACTER
002712  004537  010170          JSR     R5,LIC          ;LOAD A BUFFER STARTING WITH
002716  001320                  WIDTH                   ; THAT CHARACTER AND WIDTH (BYTE)

002720  004737  010236          JSR     PC,XPRNT        ;DISPLAY A FULL LINE FROM THE BUFFER

002724  005337  001314          DEC     TEMPO           ;DONE ?
002730  001005                  BNE     2$              ;BR IF YES
002732  004737  011262          JSR     PC,DELAY
002736  013737  001266  001314  MOV     VHO,TEMPO
002744  005237  001306  2$:     INC     STCHAR          ;UPDATE THE STARTING CHARACTER
002750  023737  001310  001306  CMP     LASTCH,STCHAR   ;TEST FOR FINAL CHARACTER
002756  001353                  BNE     1$              ;BRANCH IF NOT COMPLETED

002760  004737  011262          JSR     PC,DELAY        ;TEST DELAY SWITCH

                        ;;*****************************************************************
                        ;*TEST 6         F       CURSOR MOTION TEST
                        ;;*****************************************************************
002764  000004          TST6:   SCOPE
002766  004537  011442          JSR     R5,AMSG         ;DISPLAY HEADING
002772  013435                  M96

                        ;ROUTINE TO LOAD REFERENCE LINES FOR CURSOR MOTION TEST

002774  012700  025256  LBMT:   MOV     #BUFFER,R0      ;LOAD POINTER
003000  012720  000065          MOV     #65,(R0)+       ;LOAD #5
003004  013701  001270          MOV     VH1,R1          ;LOAD R1
003010  005301                  DEC     R1
003012  004737  003110          JSR     PC,MOVDN1       ;MOVE CURSOR DOWN
003016  004737  003126          JSR     PC,MOVRIG       ;MOVE RIGHT
003022  112720  000062          MOVB    #62,(R0)+       ;LOAD #2
003026  004737  003126          JSR     PC,MOVRIG       ;MOVE RIGHT
003032  004737  003126          JSR     PC,MOVRIG       ;MOVE RIGHT
003036  112720  000040          MOVB    #40,(R0)+
003042  112720  000061          MOVB    #61,(R0)+       ;LOAD #1
003046  004737  003104          JSR     PC,MOVDWN       ;MOVE DOWN
003052  004737  003126          JSR     PC,MOVRIG       ;MOVE RIGHT
003056  112720  000063          MOVB    #63,(R0)+       ;LOAD #3
003062  004737  003126          JSR     PC,MOVRIG
003066  004737  003126          JSR     PC,MOVRIG       ;MOVE RIGHT
003072  112720  000064          MOVB    #64,(R0)+       ;LOAD #4
003076  112710  000377          MOVB    #377,(R0)       ;TERM
003102  000420                  BR      LBMT1           ;;BR TO NEXT PART
```

```
                                                
                        003104  013701  001270          MOVDWN: MOV     VH1,R1
                        003110  112720  000015          MOVDN1: MOVB    #15,(R0)+       ;LOAD CR
                        003114  112720  000012                  MOVB    #12,(R0)+       ;LOAD LF
                        003120  005301                          DEC     R1
                        003122  001372                          BNE     MOVDN1          ;LOOP UNTIL DONE
                        003124  000207                          RTS     PC              ;EXIT
                                                
                        003126  012701  000024          MOVRIG: MOV     #20.,R1         ;LOAD R1
                        003132  112720  000040          1$:     MOVB    #40,(R0)+       ;LOAD SPACES
                        003136  005301                          DEC     R1
                        003140  100374                          BPL     1$              ;LOOP UNTIL DONE
                        003142  000207                          RTS     PC              ;EXIT
                                                
                        003144  004737  010236          LBMT1:  JSR     PC,XPRNT        ;DISPLAY THIS LINE
                        003150  004737  011262                  JSR     PC,DELAY        ;TEST DELAY SWITCH
                                                
                                                        ;CURSOR MOTION SUBROUTINE
                                                        ;IF VT50H TYPE - USE "ESC-D" FOR CURSOR LEFT AND USE "ESC-B" FOR CURSOR DOWN
                        003154  013701  001270          LCM:    MOV     VH1,R1          ;LOAD COUNT
                        003160  012700  025256                  MOV     #BUFFER,R0      ;LOAD BUFFER POINTER
                        003164  112720  000033          1$:     MOVB    #33,(R0)+       ;LOAD 'ESC'
                        003170  112720  000101                  MOVB    #101,(R0)+      ;LOAD 'A' CURSOR UP
                        003174  005301                          DEC     R1
                        003176  001372                          BNE     1$              ;LOOP UNTIL DONE
                        003200  112720  000130                  MOVB    #130,(R0)+      ;LOAD 'X'
                        003204  012701  000054                  MOV     #44.,R1         ;LOAD COUNT
                        003210  032737  020000  001260          BIT     #BIT13,VT5XX    ;TEST IF VT50H TYPE
                        003216  001407                          BEQ     20$             ;BR IF NOT
                        003220  112720  000033          2$:     MOVB    #33,(R0)+       ;LOAD 'ESC'
                        003224  112720  000104                  MOVB    #104,(R0)+      ;LOAD 'CURSOR LEFT'
                        003230  005301                          DEC     R1
                        003232  100372                          BPL     2$              ;LOOP UNTIL DONE
                        003234  000404                          BR      21$
                        003236  112720  000010          20$:    MOVB    #10,(R0)+       ;LOAD "BACKSPACE
                        003242  005301                          DEC     R1              ;DONE ALL ?
                        003244  100374                          BPL     20$             ;BR IF NOT
                        003246  112720  000130          21$:    MOVB    #130,(R0)+      ;LOAD 'X'
                        003252  112720  000010                  MOVB    #10,(R0)+       ;LOAD BACKSPACE
                        003256  013701  001270                  MOV     VH1,R1          ;LOAD COUNT
                        003262  032737  020000  001260          BIT     #BIT13,VT5XX    ;TEST IF VT50H TYPE
                        003270  001407                          BEQ     30$             ;BR IF NOT
                        003272  112720  000033          3$:     MOVB    #33,(R0)+       ;LOAD 'ESC' CURSOR DOWN
                        003276  112720  000102                  MOVB    #102,(R0)+      ;
                        003302  005301                          DEC     R1
                        003304  001372                          BNE     3$              ;LOOP UNTIL DONE
                        003306  000404                          BR      31$
                        003310  112720  000012          30$:    MOVB    #12,(R0)+       ;LOAD CURSOR DOWN (LF)
                        003314  005301                          DEC     R1              ;DONE ?
                        003316  001374                          BNE     30$             ;BR IF NOT
                        003320  112720  000130          31$:    MOVB    #130,(R0)+      ;LOAD 'X'
                        003324  112720  000010                  MOVB    #10,(R0)+       ;LOAD BACKSPACE
                        003330  012701  000052                  MOV     #42.,R1         ;LOAD COUNT
                        003334  112720  000033          4$:     MOVB    #33,(R0)+       ;LOAD 'ESC'
                        003340  112720  000103                  MOVB    #103,(R0)+      ;LOAD 'C' CURSOR RIGHT
                        003344  005301                          DEC     R1
```

```
003346  100372                  BPL     4$                      ;LOOP UNTIL DONE
003350  112720  000130          MOVB    #130,(R0)+              ;LOAD 'X'
003354  112720  000033          MOVB    #33,(R0)+               ;LOAD 'ESC'
003360  112720  000110          MOVB    #110,(R0)+              ;LOAD 'H' CURSOR HOME
003364  112720  000130          MOVB    #130,(R0)+
003370  112720  000377          MOVB    #377,(R0)+
003374  004737  010236          JSR     PC,XPRNT                ;DISPLAY THIS LINE
003400  004737  011262          JSR     PC,DELAY                ;DELAY
003404  004537  011442          JSR     R5,AMSG                 ;
                                CRLFB
003410  016463                  TST     VISXX                   ;TEST IF 24 LINES
003414  005737  001260          BPL     TST7                    ;BR IF 12 LINES
003420  100003                  JSR     R5,AMSG                 ;SCROLL MORE LINES
003422  004537  011442          CRLFB
003426  016463
                        ;;**********************************************************
                        ;;TEST 7         G       TAB, BACKSPACE AND BELL TEST
                        ;;**********************************************************
003430  000004            TST7:   SCOPE
003432  004537  011442          JSR     R5,AMSG                 ;DISPLAY HEADING
003436  013470                  M97
003440
003442  012700  025256  CRL:    MOV     #BUFFER,R0              ;LOAD BUFFER POINTER
003446  112720  000007          MOVB    #7,(R0)+                ;LOAD 'BELL'
003452  012701  000011          MOV     #9.,R1                  ;LOAD LINE COUNT
003456  012702  000006  1$:     MOV     #6.,R2                  ;LOAD COLUMN COUNT
003462  112720  000111          MOVB    #111,(R0)+              ;LOAD COLUMN MARK
003466  112720  000040  2$:     MOVB    #40,(R0)+               ;LOAD SPACE
003470  005302                  DEC     R2                      ;
003472  100374                  BPL     2$                      ;BR UNTIL DONE
003474  005301                  DEC     R1                      ;
003476  100366                  BPL     1$                      ;BR UNTIL FINISHED ALL TAB STOPS
003502  112720  000015          MOVB    #15,(R0)+               ;LOAD CR
003506  112720  000012          MOVB    #12,(R0)+               ;LOAD LF
003512  112720  000377          MOVB    #377,(R0)+              ;LOAD TERM
003516  004737  010236          JSR     PC,XPRNT
003522  004537  003706          JSR     R5,LTAB                 ;LOAD TAB LINE #1
003524  000000                  0
003530  004737  010236          JSR     PC,XPRNT                ;DISPLAY THIS LINE
003534  004537  003706          JSR     R5,LTAB                 ;LOAD TAB LINE #2
003536  000001                  1
003542  004737  010236          JSR     PC,XPRNT                ;DISPLAY THIS LINE
003546  004537  003706          JSR     R5,LTAB                 ;LOAD TAB LINE #3
003550  000002                  2
003554  004737  010236          JSR     PC,XPRNT                ;DISPLAY THIS LINE
003560  004537  003706          JSR     R5,LTAB                 ;LOAD TAB LINE #4
003562  000003                  3
003566  004737  010236          JSR     PC,XPRNT                ;DISPLAY THIS LINE
003572  004537  003706          JSR     R5,LTAB                 ;LOAD TAB LINE #5
003576  000004                  4
```

```
1089  003574  004737  010236                    JSR     PC,XPRNT        ;DISPLAY THIS LINE
1090
1091  003600  004537  003706                    JSR     R5,LTAB         ;LOAD TAB LINE #6
1092  003604  000005                            5
1093  003606  004737  010236                    JSR     PC,XPRNT        ;DISPLAY THIS LINE
1094
1095  003612  004537  003706                    JSR     R5,LTAB         ;LOAD TAB LINE #7
1096  003616  000006                            6
1097  003620  004737  010236                    JSR     PC,XPRNT        ;DISPLAY THIS LINE
1098                                    ;NOW EXECUTE THE BACKSPACE SECTION
1099
1100  003624  013702  001320                    MOV     WIDTH,R2        ;LOAD WIDTH COUNT
1101  003630  005302                            DEC     R2              ;ADJUST WIDTH
1102  003632  005302                            DEC     R2              ;  BY 2
1103  003634  012701  000040                    MOV     #40,R1          ;LOAD "SPACE" INTO THE LINE
1104  003640  004737  010140                    JSR     PC,FILBFB       ;LOAD LINE
1105  003644  013701  001320                    MOV     WIDTH,R1        ;LOAD # OF CHARACTER POSITIONS
1106  003650  112720  000130          3$:       MOVB    #'X,(R0)+       ;LOAD ASCII "X"
1107  003654  112720  000010                    MOVB    #10,(R0)+       ;LOAD BACKSPACE CODE
1108  003660  112720  000010                    MOVB    #10,(R0)+
1109  003664  005301                            DEC     R1              ;DONE ALL POSITIONS ?
1110  003666  001370                            BNE     3$              ;BR IF NOT
1111  003670  112720  000377                    MOVB    #377,(R0)+      ;LOAD TERM.
1112  003674  004737  010236                    JSR     PC,XPRNT        ;EXECUTE ASCII CODE
1113  003700  004737  011262                    JSR     PC,DELAY        ;TEST DELAY SWITCH
1114  003704  000434                            BR      TST10           ;;BR TO NEXT TEST
1115
1116                                    ;SUBROUTINE TO LOAD THE TAB TEST INTO THE BUFFER
1117
1118  003706  012537  001322          LTAB:     MOV     (R5)+,SAVE1     ;LOAD # OF CHARACTERS
1119  003712  012702  025256                    MOV     #BUFFER,R2      ;LOAD BUFFER POINTER
1120  003716  012701  000011                    MOV     #9.,R1          ;LOAD WIDTH COUNTER
1121  003722  112722  000007                    MOVB    #7,(R2)+        ;LOAD BELL AT START OF LINE
1122  003726  112722  000111          3$:       MOVB    #'I,(R2)+       ;LOAD 'I
1123  003732  013700  001322                    MOV     SAVE1,R0        ;GET THE  NO. OF THE CHAR
1124  003736  001404                            BEQ     1$              ;BR IF 0
1125  003740  112722  000101          2$:       MOVB    #'A,(R2)+       ;LOAD THE 'A' CHAR.
1126  003744  005300                            DEC     R0              ;
1127  003746  001374                            BNE     2$              ;LOOP UNTIL DONE
1128  003750  112722  000011          1$:       MOVB    #11,(R2)+       ;LOAD 'TAB' CHAR
1129  003754  005301                            DEC     R1              ;
1130  003756  100363                            BPL     3$              ;BR TO NEXT TAB COLUMN CHAR
1131  003760  112722  000015                    MOVB    #15,(R2)+       ;LOAD 'CR'
1132  003764  112722  000012                    MOVB    #12,(R2)+       ;LOAD 'LF'
1133  003770  112722  000377                    MOVB    #377,(R2)+      ;LOAD TERM
1134  003774  000205                            RTS     R5              ;EXIT
1135                            ;;*****************************************************************
  (3)                           ;;TEST 10       H       ERASE FROM CURSOR TO END OF LINE
  (3)                           ;;*****************************************************************
  (2)   003776  000004          TST10:    SCOPE
1136  004000  004537  011442                    JSR     R5,AMSG         ;DISPLAY HEADING
1137  004004  013536                            M910
1138
1139  004006  004737  013010                    JSR     PC,FILLWC       ;FILL BUFFER WITH A CHAR
1140                                            ;DISPLAY THIS LINE
1141  004012  004737  011262                    JSR     PC,DELAY        ;DELAY
```

```
1142
1143                                        ;LOAD ERASE LINE TEST INTO BUFFER
1144
1145  004016  012700  025256          LODERL: MOV     #BUFFER,R0
1146  004022  112720  000033                  MOVB    #33,(R0)+       ;LOAD ESC
1147  004026  112720  000110                  MOVB    #'H,(R0)+       ;LOAD HOME
1148  004032  013737  001266  004134          MOV     VHO,2$          ;LOAD COUNT
1149  004040  005337  004134                  DEC     2$
1150  004044  112720  000033          3$:     MOVB    #33,(R0)+       ;LOAD ESC
1151  004050  112720  000113                  MOVB    #'K,(R0)+       ;LOAD ERASE LINE CHAR
1152  004054  005337  004134                  DEC     2$              ;FINISHED ?
1153  004060  100427                          BMI     1$              ;BR WHEN DONE
1154  004062  012737  000006  004136          MOV     #6.,10$         ;LOAD COUNT
1155  004070  005737  001260                  TST     VTSXX           ;TEST IF 12 LINES
1156  004074  100005                          BPL     4$              ;BR IF 12 LINES
1157  004076  006237  004136                  ASR     10$             ;ADJUST HORIZ. COUNT
1158  004102  000240                          NOP
1159  004104  000240                          NOP
1160  004106  000240                          NOP
1161  004110  112720  000033          4$:     MOVB    #33,(R0)+
1162  004114  112720  000103                  MOVB    #'C,(R0)+       ;CURSOR RIGHT
1163  004120  005337  004136                  DEC     10$             ;
1164  004124  001371                          BNE     4$              ;LOOP
1165  004126  112720  000012                  MOVB    #12,(R0)+       ;CURSOR DOWN
1166  004132  000744                          BR      3$
1167  004134  000000          2$:     0
1168  004136  000000          10$:    0
1169  004140  112720  000377          1$:     MOVB    #377,(R0)+      ;LOAD TERM
1170
1171
1172  004144  004737  010236                  JSR     PC,XPRNT        ;DISPLAY THIS TEST
1173
1174  004150  004737  011262                  JSR     PC,DELAY        ;TEST DELAY SWITCH
1175
1176                                        ;;**************************************************************
(3)                                         ;*TEST 11        I       ERASE FROM CURSOR TO END OF SCREEN
(3)                                         ;;**************************************************************
(2)  004154  000004                         T$T11:  SCOPE
1177  004156  004537  011442                  JSR     R5,AMSG         ;DISPLAY HEADING
1178  004162  013567                          M911
1179  004164  004737  013010                  JSR     PC,FILLWC       ;FILL BUFFER WITH A CHAR
1180                                                                    ;DISPLAY THIS LINE
1181  004170  004737  011262                  JSR     PC,DELAY        ;DELAY
1182
1183                                        ;LOAD ERASE SCREEN TEST INTO BUFFER
1184
1185  004174  013737  001320  004270  LODERS: MOV     WIDTH,2$        ;LOAD COUNT
1186  004202  006237  004270                  ASR     2$
1187  004206  012700  025256                  MOV     #BUFFER,R0
1188  004212  112720  000010          1$:     MOVB    #10,(R0)+       ;LOAD CURSOR LEFT
1189  004216  005337  004270                  DEC     2$              ;DONE ?
1190  004222  100373                          BPL     1$              ;BR UNTIL DONE
1191  004224  013737  001266  004270          MOV     VHO,2$          ;LOAD COUNT
1192  004232  112720  000033          4$:     MOVB    #33,(R0)+       ;LOAD ESC
1193  004236  112720  000112                  MOVB    #'J,(R0)+       ;LOAD ERASE SCREEN
1194  004242  005337  004270                  DEC     2$              ;DONE ?
```

```
1195  004246  100405                          BMI     3$                      ;BR WHEN DONE
1196  004250  112720  000033                  MOVB    #33,(R0)+               ;LOAD ESC
1197  004254  112720  000101                  MOVB    #'A,(R0)+               ;LOAD CURSOR UP
1198  004260  000764                          BR      4$                      ;LOOP
1199  004262  112720  000377          3$:     MOVB    #377,(R0)+              ;LOAD TERM
1200  004266  000401                          BR      5$
1201  004270  000000                  2$:     0
1202
1203  004272  004737  010236          5$:     JSR     PC,XPRNT                ;DISPLAY THIS TEST
1204  004276  004737  011262                  JSR     PC,DELAY                ;TEST DELAY SWITCH
1205
1206                                  ;;**********************************************************************
(3)                                   ;*TEST 12        J       VIDEO COUPLING TEST
(3)                                   ;;**********************************************************************
(2)   004302  000004                  TST12:  SCOPE
1207  004304  004537  011442                  JSR     R5,AMSG                 ;DISPLAY HEADER
1208  004310  013622                          M912
1209  004312  013737  001270  001312          MOV     VH1,TEMP                ;LOAD COUNTER
1210  004320  004537  011442          1$:     JSR     R5,AMSG
1211  004324  016511                          PATH
1212
1213  004326  005337  001312                  DEC     TEMP                    ;FINISHED COUNT ?
1214  004332  001372                          BNE     1$                      ;BR UNTIL DONE
1215  004334  004737  011262                  JSR     PC,DELAY                ;TEST DELAY SWITCH
1216
1217                                  ;;**********************************************************************
(3)                                   ;*TEST 13        K       DIRECT CURSOR ADDRESS TEST
(3)                                   ;;**********************************************************************
(2)   004340  000004                  TST13:  SCOPE
1218                                  ;       RANDOM NUMBERS ARE GENERATED AND USED AS "X" AND "Y" COORDINATES
1219                                  ;ADDRESSING A 960 CHARACTER PRINTOUT.
1220                                  ;VERFICATION OF DISPLAY IS PERFORMED VISUALLY BY THE USER
1221                                  ;EXECUTE 1ST TIME USING "ESC-Y" SEQUENCE AND IF I.D. IS AN "H"
1222                                  ;       EXECUTE 2ND TIME USING "CODE 16" SEQUENCE
1223
1224  004342  032737  020000  001260          BIT     #BIT13,VTSXX            ;TEST IF DCA TYPE TERMINAL
1225  004350  001002                          BNE     3$                      ;;BR IF CURSOR ADDRESSING
1226  004352  000137  005100          1$:     JMP     TST14                   ;BYPASS THIS TEST
1227  004356  005737  001332          3$:     TST     WFTEST                  ;TEST IF IN W.F. MODE
1228  004362  001373                          BNE     1$                      ;BYPASS IF W.F. MODE
1229  004364  004537  011442                  JSR     R5,AMSG                 ;ERASE SCREEN AND IDENTIFY TEST
1230  004370  020110                          M98
1231  004372  112737  000033  025256          MOVB    #33,BUFFER              ;LOAD "ESC" CODE
1232  004400  112737  000131  025257          MOVB    #'Y,BUFFER+1            ;LOAD ASCII "Y" (D.C.A. ENABLE)
1233  004406  004737  004462                  JSR     PC,DCATST               ;RUN TEST WITH ESC Y SEQUENCE
1234  004412  004737  011262                  JSR     PC,DELAY                ;DELAY TESTING
1235  004416  122737  000110  001260          CMPB    #'H,VTSXX               ;TEST IF VT50H TYPE DISPLAY
1236  004424  001352                          BNE     1$                      ;;BR IF NOT VT50H TYPE
1237  004426  004537  011442                  JSR     R5,AMSG                 ;ERASE SCREEN AND IDENTIFY TEST
1238  004432  020110                          M98
1239  004434  112737  000000  025256          MOVB    #0,BUFFER               ;LOAD "SPACE" AS FIRST VALUE
1240  004442  112737  000016  025257          MOVB    #16,BUFFER+1            ;LOAD CODE-16 SEQUENCE
1241  004450  004737  004462                  JSR     PC,DCATST               ;RUN TEST WITH CODE 16 SEQUENCE
1242  004454  004737  011262                  JSR     PC,DELAY
1243  004460  000734                          BR      1$                      ;;BR TO NEXT TEST
1244
```

```
1245  004462  012737  123456  024756  DCATST: MOV     #123456,$LONUM  ;PRIME RANDOM NUMBER GENERATOR
1246  004470  012737  176543  024754          MOV     #176543,$HINUM
1247  004476  013737  001264  004754          MOV     TOTALC,OVRAL    ;LOAD CHAR COUNT
1248  004504  013737  001266  004752          MOV     VHO,SET         ;LOAD LINE COUNT
1249  004512  012700  025276                  MOV     #BUFFER+20,R0   ;LOAD DESTINATION BUFFER
1250  004516  012701  004756          2$:     MOV     #MSGTXT,R1      ;LOAD MESSAGE POINTER
1251  004522  012120                  1$:     MOV     (R1)+,(R0)+     ;LOAD 2 CHARACTERS
1252  004524  022701  005076                  CMP     #MSGTND,R1      ;TEST FOR LAST CHAR
1253  004530  001374                          BNE     1$              ;BR UNTIL DONE 1 LINE
1254  004532  005337  004752                  DEC     SET             ;FINISHED ALL LINES
1255  004536  001367                          BNE     2$              ;BR IF NOT
1256  004540  012737  177777  025262          MOV     #-1,BUFFER+4    ;LOAD MESSAGE TERMINATOR
1257
1258  004546  004737  024656          GENER:  JSR     %7,$RAND        ;GENERATE RANDOM NUMBER
1259  004552  013700  024754                  MOV     $HINUM,R0       ;GET RNADOM NUMBER
1260  004556  042700  177700                  BIC     #177700,%0      ;RANDOM NO, MUST BE TWO DIGITS
1261  004562  020027  000037                  CMP     %0,#37          ;NO, MUST BE LESS THAN 40
1262  004566  101767                          BLOS    GENER           ;LOWER, REGENERATION
1263  004570  020037  001262                  CMP     %0,LASTLN               ;NO, MUST NOT BE GREATER THAN 54 OR 67
1264  004574  101364                          BHI     GENER           ;GREATER, REGENERATION
1265  004576  010037  004746                  MOV     %0,YADDS        ;STORE RANDOM Y COORDINATE
1266  004602  010001                          MOV     %0,%1           ;COPY DATA
1267  004604  012737  025276  004752          MOV     #BUFFER+20,SET  ;LOAD BASE POINTER
1268  004612  162701  000040                  SUB     #40,%1          ;MINIMUM Y INDEX
1269  004616  001405                          BEQ     GENRX           ;RESULT, MINIMUM Y COORDINATE
1270  004620  062737  000120  004752  1$:     ADD     #80.,SET        ;SETUP  Y INDEX LOCATION FOR PRINTOUT
1271  004626  005301                          DEC     %1
1272  004630  001373                          BNE     1$              ;Y COORDINATE IS SET
1273  004632  004737  024656          GENRX:  JSR     %7,$RAND        ;GENERATE RANDOM NUMBER
1274  004636  013700  024754                  MOV     $HINUM,R0       ;GET A RANDOM NUMBER
1275  004642  042700  177600                  BIC     #177600,%0      ;RANDOM NO. MAY BE LESS THAN 200
1276  004646  020027  000037                  CMP     %0,#37          ; MUST NOT BE LESS THAN 40
1277  004652  101767                          BLOS    GENRX           ;LOWER, REGENERATION
1278  004654  020027  000157                  CMP     %0,#157         ; MUST NOT BE GREATER THAN 157
1279  004660  101364                          BHI     GENRX           ;GREATER, REGENERATION
1280  004662  010037  004750                  MOV     %0,XADDS        ;STORE RANDOM X COORDINATE
1281  004666  162700  000040                  SUB     #40,%0          ;SETUP MINIMUM X INDEX
1282  004672  060037  004752                  ADD     %0,SET          ;SETUP X COOR, FOR PNTOUT.
1283  004676  013701  004752                  MOV     SET,%1          ;SETUP CHECK
1284  004702  105711                          TSTB    (1)             ;HAS CURRENT CHAR, ALREADY BEEN USED?
1285  004704  100720                          BMI     GENER           ;YES, REGENERATE
1286  004706  113737  004746  025260          MOVB    YADDS,BUFFER+2  ;LOAD Y COORDINATE
1287  004714  113737  004750  025261          MOVB    XADDS,BUFFER+3  ;LOAD X COORDINATE
1288  004722  111137  025262                  MOVB    (1),BUFFER+4    ;LOAD CHARACTER TO BE PRINTED
1289  004726  152711  000200                  BISB    #200,(1)        ;INDICATE USE OF CURSOR POSITION
1290  004732  004737  010236                  JSR     PC,XPRNT        ;EXECUTE AND PRINT CHARACTER
1291  004736  005337  004754                  DEC     OVRAL           ;MAXIMUM NO. OF COORDINATES
1292  004742  001301                          BNE     GENER           ;BR BACK UNTIL DONE
1293  004744  000207                          RTS     PC              ;EXIT
1294
1295  004746  000000                  YADDS:  0
1296  004750  000000                  XADDS:  0
1297  004752  000000                  SET:    0
1298  004754  000000                  OVRAL:  0
1299  004756  052126  030065  050055  MSGTXT: .ASCII   VT50-PLUS-DIRECT-CURSOR-ADDRESSING-TEST
      004764  052514  026523  044504
```

```
                004772  042522  052103  041455
                005000  051125  047523  026522
                005006  042101  051104  051505
                005014  044523  043516  052055
                005022  051505     124
1300            005025      055  044504  044507          .ASCII  \-DIGITAL-EQUIPMENT-CORP.-MAYNARD-MA.-VT50
                005032  040524  026514  050505
                005040  044525  046520  047105
                005046  026524  047503  050122
                005054  026456  040515  047131
                005062  051101  026504  040515
                005070  026456  052126  030065
1301            005076  100000                  MSGTND: BIT15
1302                                            ;ONLY 12 LINE TERMINALS WILL RUN THIS TEST
1303                                            ;;*****************************************************************
(3)                                             ;*TEST 14        L       HOLD SCREEN TEST
(3)                                             ;;*****************************************************************
(2)             005100  000004                  TST14:  SCOPE
1304            005102  005037  010656                  CLR     AXOFF
1305            005106  005037  010660                  CLR     XOFFRC          ;CLEAR SOFT FLAG
1306            005112  004537  011442                  JSR     R5,AMSG         ;DISPLAY
1307            005116  016463                          CRLFB
1308            005120  004537  011442                  JSR     R5,AMSG         ;CR-LF
1309            005124  016463                          CRLFB
1310
1311            005126  005737  001332                  TST     WFTEST          ;TEST IF IN W.F. MODE
1312            005132  001046                          BNE     TST15           ;BR IF W.F. MODE
1313            005134  005737  001260                  TST     VTSXX           ;TEST IF 12 LINE
1314            005140  100443                          BMI     TST15           ;BR IF NOT 12 LINE
1315            005142  004537  011442                  JSR     R5,AMSG         ;DISPLAY MESSAGE
1316            005146  014007                          M922
1317
1318            005150  012737  000001  010654          MOV     #1,XOFFOK
1319            005156  012737  000001  010652          MOV     #1,XOFFBR       ;ENABLE XOFF
1320            005164  004537  011442                  JSR     R5,AMSG         ;TRY TO  SCROLL THE SCREEN
1321            005170  020000                          GOHDSC                  ;ENABLE HOLD SCREEN
1322
1323            005172  005737  010660                  TST     XOFFRC          ;TEST IF XOFF SENSED
1324            005176  001001                          BNE     1$              ;BR IF SENSED
1325
1326            005200  104002                          ERROR   2               ;ENABLE HOLD SCREEN MODE FAILED TO
1327                                                                            ;INHIBIT THE SCREEN FROM SCROLLING
1328                                                                            ;BY SENDING "X-OFF"
1329
1330            005202  005037  010662          1$:     CLR     XONRC           ;CLEAR SOFT FLAG
1331            005206  005037  010652                  CLR     XOFFBR
1332            005212  012737  000001  010656          MOV     #1,AXOFF
1333            005220  004537  011442                  JSR     R5,AMSG
1334            005224  020026                          GODSHS                  ;DISABLE HOLD SCREEN MODE
1335
1336            005226  004537  011442                  JSR     R5,AMSG
1337            005232  016474                          CRLFA                   ;TRY SCROLLING THE SCREEN
1338
1339            005234  005737  010662                  TST     XONRC           ;TEST SOFT FLAG (X-ON)
1340            005240  001001                          BNE     2$              ;BR IF SENSED
1341
```

```
1342  005242  104002                          ERROR   2               ;DISABLE HOLD SCREEN MODE FAILED TO ENABLE
1343                                                                  ;THE SCREEN TO SCROLL BY SENDING AN "X-ON"
1344
1345  005244  004737  011262          2$:     JSR     PC,DELAY        ;PROGRAM DELAY
1346
                                    ;;*****************************************************************
                                    ;*TEST 15       M       TEST GRAPHICS MODE AND REV. LINE FEED
                                    ;;*****************************************************************
      005250  000004                TST15:  SCOPE
1348  005252  032737  001000  001260        BIT     #BIT09,VT5XX    ;IS UNIT VT52?
1349  005260  001002                        BNE     GRPHST          ;YES-TEST GRAPHICS AND REV. LINE FEED
1350  005262  000137  005362                JMP     COPTST          ;NO-GO CHECK FOR COPIER
1351  005266  012704  000120        GRPHST: MOV     #80.,R4
1352  005272  004537  011442        1$:     JSR     R5,AMSG         ;HOME THE CURSOR AND CLEAR THE SCREEN.
1353  005276  016503                        HOMERS
1354  005300  004537  011442                JSR     R5,AMSG         ;DISPLAY TEST MESSAGE
1355  005304  014044                        M9221
1356  005306  004537  011442                JSR     R5,AMSG         ;ENTER GRAPHICS MODE.
1357  005312  021555                        ENGRAF
1358  005314  012737  000045  001314        MOV     #37.,TEMPO      ;SET UP TO XMIT 80 LINES
1359  005322  004737  011220        2$:     JSR     PC,GBBUF        ;LOAD BUFFER WITH GRAPHICS
1360  005326  004737  010236                JSR     PC,XPRNT        ;DISPLAY 1 LINE
1361  005332  004537  011442                JSR     R5,AMSG         ;ISSUE REV. LINE FEED AND
1362  005336  021536                        REVLF                   ;A CARRIAGE RETURN
1363  005340  005304                        DEC     R4              ;DECREMENT BUFFER COUNT
1364  005342  005337  001314        3$:     DEC     TEMPO           ;DONE?
1365  005346  001365                        BNE     2$              ;NO-LOOP
1366  005350  004537  011442                JSR     R5,AMSG         ;YES-EXIT GRAPHICS MODE
1367  005354  021562                        EXGRAF
1368  005356  004737  011262                JSR     PC,DELAY        ;AND GO CHECK DELAY
1369  005362                        COPTST:
                                    ;;*****************************************************************
                                    ;*TEST 16       N       COPIER - AUTO COPY TEST
                                    ;;*****************************************************************
      005362  000004                TST16:  SCOPE
1370  005364  032737  040000  001260        BIT     #BIT14,VT5XX    ;TEST IF COPIER IS AVAILABLE
1371  005372  001002                        BNE     2$              ;;BR IF AVAILABLE
1372  005374  000137  006342        3$:     JMP     PRNTST          ;NOT AVAILABLE SO BYPASS COPIER TESTS
1373  005400  032777  004000  173532  2$:     BIT     #BIT11,@SWR     ;TEST IF INHIBIT COPIER TEST SWITCH IS SE
1374  005406  001372                        BNE     3$              ;BR IF SET
1375  005410  032777  002000  173522        BIT     #BIT10,@SWR     ;TEST IF PAPER SAVE SWITCH IS SET
1376  005416  001406                        BEQ     6$              ;BR IF NOT SET AND START COPIER TESTING
1377  005420  105737  001274                TSTB    PRTCNT          ;TEST IF TIME TO TEST COPIER
1378  005424  001363                        BNE     3$              ;NOT TIME TO RUN THE COPIER
1379  005426  013737  001250  001274        MOV     PTCT,PRTCNT     ;RELOAD COUNTER AND TEST COPIER
1380
1381  005434  004537  011442        6$:     JSR     R5,AMSG
1382  005440  014121                        M923                    ;DISPLAY HEADER
1383  005442  004537  011442                JSR     R5,AMSG         ;ENABLE AUTO-COPY
1384  005446  020054                        GOAPMD
1385
1386  005450  013737  001266  001314        MOV     VHO,TEMPO       ;LOAD A EXECUTION COUNT
1387  005456  012701  000101                MOV     #101,R1         ;LOAD A CHARACTER
1388  005462  004737  010134                JSR     PC,FILBUF       ;LOAD CHARACTER INTO BUFFER
1389  005466  012737  000001  010654  1$:     MOV     #1,XOFFOK
1390  005474  004737  010236                JSR     PC,XPRNT        ;DISPLAY IT
```

```
1391  005500  004737  011262                    JSR     PC,DELAY        ;PROGRAM DELAY
1392  005504  005337  001314                    DEC     TEMPO           ;FINISHED ?
1393  005510  100366                            BPL     1$              ;BR IF NOT
1394  005512  012737  000001  010654            MOV     #1,XOFFOK
1395  005520  004537  011442                    JSR     R5,AMSG         ;DISABLE AUTO-COPY
1396  005524  020061                            GONAPM
1397  005526  004737  011262                    JSR     PC,DELAY        ;ANOTHER DELAY
1398
1399
                                        ;;*****************************************************************
                                        ;*TEST 17        0       COPIER - FULL SCREEN OF A CHARACTER
                                        ;;*****************************************************************
      005532  000004                    TST17:  SCOPE
1400  005534  004537  011442            1$:     JSR     R5,AMSG         ;DISPLAY HEADER
1401  005540  013245                            M91
1402  005542  004737  013010                    JSR     PC,FILLWC       ;FILL BUFFER WITH CHAR
1403                                                                    ;DISPLAY IT
1404  005546  012737  000001  010654            MOV     #1,XOFFOK       ;ALLOW XOFF
1405  005554  004537  011442                    JSR     R5,AMSG         ;COPY INST
1406  005560  017752                            GOPRNT
1407  005562  004737  011262                    JSR     PC,DELAY
1408
1409
1410
                                        ;;*****************************************************************
                                        ;*TEST 20        P       COPIER - DATA PATH TEST
                                        ;;*****************************************************************
      005566  000004                    TST20:  SCOPE
1411  005570  004537  011442                    JSR     R5,AMSG         ;DISPLAY HEADING
1412  005574  013313                            M92
1413  005576  013737  001270  001312            MOV     VH1,TEMP        ;SET-UP A COUNTER
1414  005604  004537  011154                    JSR     R5,DTPSR        ;SET-UP BUFFER
1415  005610  000077                            77                      ;OCTAL '?'
1416  005612  000100                            100                     ;OCTAL '@'
1417  005614  004537  011160                    JSR     R5,DTPSRB       ;SET-UP BUFFER
1418  005620  000125                            125                     ;OCTAL 'U'
1419  005622  000052                            52                      ;OCTAL '*'
1420  005624  004737  010236            1$:     JSR     PC,XPRNT        ;DISPLAY THIS LINE
1421  005630  005337  001312                    DEC     TEMP            ;COMPLETED FULL COUNT?
1422  005634  001373                            BNE     1$              ;BRANCH IF NOT COMPLETED
1423  005636  012737  000001  010654            MOV     #1,XOFFOK
1424  005644  004537  011442                    JSR     R5,AMSG
1425  005650  017752                            GOPRNT                  ;COPY INST
1426  005652  004737  011262                    JSR     PC,DELAY        ;TEST DELAY SWITCH
1427
1428
                                        ;;*****************************************************************
                                        ;*TEST 21        Q       COPIER - SINGLE CHARACTER ACROSS ALL COLS. (ALL CHARACTERS.
                                        ;;*****************************************************************
      005656  000004                    TST21:  SCOPE
1429  005660  004537  011442                    JSR     R5,AMSG         ;DISPLAY HEADING
1430  005664  013342                            M93
1431  005666  012737  000040  001306            MOV     #40,STCHAR      ;SET-UP STARTING CHARACTER
1432  005674  013737  001266  001314            MOV     VH0,TEMPO
1433  005702  013701  001306            1$:     MOV     STCHAR,R1       ;LOAD R1= TO CHARACTER
1434  005706  004737  010134                    JSR     PC,FILBUF       ;LOAD A BUFFER WITH THAT CHARACTER
1435  005712  004737  010236                    JSR     PC,XPRNT        ;DISPLAY A FULL LINE FROM THE BUFFER
1436  005716  005337  001314                    DEC     TEMPO           ;DONE
1437  005722  001011                            BNE     3$
```

```
1438  005724  013737  001266  001314          MOV     VHO,TEMPO
1439  005732  012737  000001  010654          MOV     #1,XOFFOK       ;ALLOW XOFF
1440  005740  004537  011442                  JSR     R5,AMSG
1441  005744  017752                          GOPRNT                  ;COPY INST
1442  005746  005237  001306          3$:     INC     STCHAR          ;UPDATE THE CHARACTER
1443  005752  023737  001310  001306          CMP     LASTCH,STCHAR   ;TEST FOR FINAL CHARACTER
1444  005760  001350                          BNE     1$              ;BRANCH IF NOT COMPLETED
1445  005762  004537  011442                  JSR     R5,AMSG         ;CRLF
1446  005766  016472                          CRLFA-2
1447  005770  012737  000001  010654          MOV     #1,XOFFOK       ;ENABLE XOFF
1448  005776  004537  011442                  JSR     R5,AMSG         ;COPY INS
1449  006002  017752                          GOPRNT
1450  006004  004737  011262                  JSR     PC,DELAY        ;TEST DELAY SWITCH
1451
1452                          ;;*****************************************************************
 (3)                        ;*TEST 22       R       COPIER - ROTATING CHARACTERS ACROSS ALL COLS. (ALL CHARACTERS)
 (3)                        ;;*****************************************************************
 (2)  006010  000004        ↑ST22:  SCOPE
1453  006012  004537  011442                  JSR     R5,AMSG         ;DISPLAY HEADING
1454  006016  013404                          M94
1455  006020  012737  000040  001306          MOV     #40,STCHAR      ;SET-UP STARTING CHARACTER
1456  006026  013737  001266  001314          MOV     VHO,TEMPO       ;
1457  006034  013701  001306          1$:     MOV     STCHAR,R1       ;LOAD R1=TO CHARACTER
1458  006040  004537  010170                  JSR     R5,LIC          ;LOAD A BUFFER STARTING WITH
1459  006044  001320                          WIDTH                   ; THAT CHARACTER AND WIDTH (BYTE)
1460  006046  004737  010236                  JSR     PC,XPRNT        ;DISPLAY A FULL LINE FROM THE BUFFER
1461  006052  005337  001314                  DEC     TEMPO           ;DONE ?
1462  006056  001011                          BNE     3$
1463  006060  013737  001266  001314          MOV     VHO,TEMPO
1464  006066  012737  000001  010654          MOV     #1,XOFFOK
1465  006074  004537  011442                  JSR     R5,AMSG
1466  006100  017752                          GOPRNT                  ;COPY INST
1467  006102  005237  001306          3$:     INC     STCHAR          ;UPDATE THE STARTING CHARACTER
1468  006106  023737  001310  001306          CMP     LASTCH,STCHAR   ;TEST FOR FINAL CHARACTER
1469  006114  001347                          BNE     1$              ;BRANCH IF NOT COMPLETED
1470  006116  004537  011442                  JSR     R5,AMSG         ;CRLF
1471  006122  016472                          CRLFA-2
1472  006124  012737  000001  010654          MOV     #1,XOFFOK       ;ENABLE XOFF
1473  006132  004537  011442                  JSR     R5,AMSG         ;COPY INST
1474  006136  017752                          GOPRNT
1475  006140  004737  011262                  JSR     PC,DELAY        ;TEST DELAY SWITCH
1476
1477                          ;;*****************************************************************
 (3)                        ;*TEST 23       S       COPIER - PERIMETER PATTERN
 (3)                        ;;*****************************************************************
 (2)  006144  000004        ↑ST23:  SCOPE
1478  006146  004537  011442                  JSR     R5,AMSG         ;DISPLAY HEADER
1479  006152  013723                          M920
1480  006154  012701  000105                  MOV     #'E,R1          ;LOAD STARTING CHARACTER
1481  006160  004737  010134                  JSR     PC,FILBUF       ;FILL THE BUFFER
1482  006164  004737  010236                  JSR     PC,XPRNT        ;DISPLAY A LINE
1483  006170  004737  010236                  JSR     PC,XPRNT        ;DISPLAY A LINE
1484  006174  013737  001270  001312          MOV     VH1,TEMP        ;LOAD VERT COUNT
1485  006202  062737  000002  001312          ADD     #2,TEMP         ;UPDATE BY 2
1486  006210  004737  011060          1$:     JSR     PC,FIRLST       ;FILL FIRST AND LAST
1487  006214  004737  010236                  JSR     PC,XPRNT        ;DISPLAY A LINE
```

```
1488  006220  005337  001312              DEC     TEMP            ;DONE ?
1489  006224  001371                      BNE     1$
1490  006226  012701  000105              MOV     #'E,R1          ;LOAD STARTING CHAR
1491  006232  004737  010134              JSR     PC,FILBUF       ;LOAD LINE WITH E'S
1492  006236  004737  010236              JSR     PC,XPRNT        ;DISPLAY A LINE
1493  006242  004737  010236              JSR     PC,XPRNT
1494  006246  012737  000001  010654      MOV     #1,XOFFOK
1495  006254  004537  011442              JSR     R5,AMSG
1496  006260  017752                      GOPRNT                  ;COPY SCREEN
1497  006262  004737  011262              JSR     PC,DELAY
1498
1499                                  ;;*******************************************************************
                                      ;*TEST 24        T       COPIER - DISCLAIMER STATEMENT
                                      ;;*******************************************************************
      006266  000004                  TST24:  SCOPE
1500
1501  006270  004537  011442              JSR     R5,AMSG         ;DISPLAY HEADER
1502  006274  013753                      M921
1503
1504  006276  005004                      CLR     R4
1505  006300  016437  006616  006314  1$: MOV     DISPCH(R4),10$  ;LOAD A POINTER
1506  006306  001405                      BEQ     2$              ;BR IF DONE
1507  006310  004537  011442              JSR     R5,AMSG         ;DISPLAY COPYRIGHT
1508  006314  022131                  10$: MTEXTO
1509  006316  005724                      TST     (R4)+           ;UPDATE POINTER
1510  006320  000767                      BR      1$
1511
1512
1513  006322  012737  000001  010654  2$: MOV     #1,XOFFOK       ;ENABLE XOFF
1514  006330  004537  011442              JSR     R5,AMSG         ;COPY SCREEN
1515  006334  017752                      GOPRNT
1516  006336  004737  011262              JSR     PC,DELAY
1517  006342  000240                  PRNTST: NOP                 ;TRY PRINTER TESTS
1518
1519
                                      ;;*******************************************************************
                                      ;*TEST 25        U       PRINTER CONTROLLER MODE TEST
                                      ;;*******************************************************************
      006344  000004                  TST25:  SCOPE
1520  006346  032737  002000  001260      BIT     #BIT10,VTSXX    ;IS UNIT EQUIPPED WITH PRINTER.
1521  006354  001002                      BNE     1$              ;YES-TEST IT
1522  006356  000137  006644              JMP     $EOP            ;NO-EXIT TEST
1523  006362  004537  011442          1$: JSR     R5,AMSG         ;DISPLAY HEADER
1524  006366  014160                      MPTCNT
1525  006370  004537  011442              JSR     R5,AMSG         ;ENABLE PRINTER CONTROLLER MODE.
1526  006374  021567                      ENPNTM
1527  006376  012737  000040  001306      MOV     #40,STCHAR      ;LOAD INITIAL CHAR.
1528  006404  013701  001306          2$: MOV     STCHAR,R1
1529  006410  004537  010170              JSR     R5,LIC          ;BUILD A 132 COL. LINE.
1530  006414  001316                      PNTWID
1531  006416  012737  000001  010654      MOV     #1,XOFFOK       ;ALLOW XOFF/XON PROTOCOL
1532  006424  004737  010236              JSR     PC,XPRNT        ;DISPLAY IT.
1533  006430  005237  001306              INC     STCHAR          ;INCREMENT 1ST CHAR.
1534  006434  023737  001306  001310      CMP     STCHAR,LASTCH   ;ISSUED 92 LINES?
1535  006442  001360                      BNE     2$              ;NO-LOOP
1536  006444  004537  011442              JSR     R5,AMSG         ;YES-DISABLE PRINTER
1537  006450  021574                      EXPNTM                  ;CONTROLLER MODE.
```

```
                                ;;*****************************************************************
                                ;;TEST 26        V       PRINT SCREEN TEST
                                ;;*****************************************************************
(2)  006456  000004             TST26:  SCOPE

                        006460  004537  011442          JSR     R5,AMSG         ;DISPLAY PRINT SCREEN MESSAGE
                        006464  014227                  MPTSCN
                        006466  004737  013010          JSR     PC,FILLWC       ;FILL THE SCREEN WITH E
                        006472  012737  000001  010654  MOV     #1,XOFFOK       ;ALLOW XOFF/XON PROTOCOL
                        006500  004537  011442          JSR     R5,AMSG         ;PRINT THEM
                        006504  017752                  GOPRNT
                        006506  004737  011262          JSR     PC,DELAY        ;TEST DELAY SWITCH.
                                ;;*****************************************************************
                                ;;TEST 27        W       AUTO PRINT TEST
                                ;;*****************************************************************
(2)  006512  000004             TST27:  SCOPE

                        006514  004537  011442          JSR     R5,AMSG
                        006520  014264                  M923A
                        006522  004537  011442          JSR     R5,AMSG         ;ENABLE AUTO-PRINT
                        006526  020054                  GOAPMD
                        006530  013737  001266  001314  MOV     VHO,TEMPO       ;LOAD A EXECUTION COUNT
                        006536  012701  000101          MOV     #101,R1         ;LOAD A CHARACTER
                        006542  004737  010134          JSR     PC,FILBUF       ;LOAD CHARACTER INTO BUFFER
                        006546  012737  000001  010654  1$:     MOV     #1,XOFFOK
                        006554  004737  010236          JSR     PC,XPRNT        ;DISPLAY IT
                        006560  004737  011262          JSR     PC,DELAY        ;PROGRAM DELAY
                        006564  005337  001314          DEC     TEMPO           ;FINISHED ?
                        006570  100366                  BPL     1$              ;BR IF NOT
                        006572  012737  000001  010654  MOV     #1,XOFFOK
                        006600  004537  011442          JSR     R5,AMSG         ;DISABLE AUTO-PRINT
                        006604  020061                  GONAPM
                        006606  004737  011262          JSR     PC,DELAY        ;ANOTHER DELAY

                        006612  000137  006644          JMP     $EOP            ;END OF PASS
                        006616  022131          DISPCH: MTEXT0
                        006620  022235                  MTEXT1
                        006622  022336                  MTEXT2
                        006624  022440                  MTEXT3
                        006626  022523                  MTEXT4
                        006630  022625                  MTEXT5
                        006632  022726                  MTEXT6
                        006634  022760                  MTEXT7
                        006636  023060                  MTEXT8
                        006640  000000                  0
                        006642  000000                  0
```

```
1607
1608
(1)
(2)                                 ;;*********************************************************************
(1)                                 ;*INCREMENT THE PASS NUMBER ($PASS)
(1)                                 ;*INDICATE END-OF-PROGRAM AFTER 1 PASSES THRU THE PROGRAM
(1)                                 ;*TYPE "END PASS #XXXXX" (WHERE XXXXX IS A DECIMAL NUMBER)
(1)                                 ;*IF THERES A MONITOR GO TO IT
(1)                                 ;*IF THERE ISN'T JUMP TO NOWEOP
(1)
(1)  006644                         $EOP:
(3)  006644  000004                         SCOPE
(3)  006646  005737  001244                 TST     LAST                    ;TEST IF MORE
(3)  006652  001414                         BEQ     1$                      ;BR IF NONE
(3)  006654  023737  001244  001246         CMP     LAST,VTNOW              ;IS THIS THE LAST ONE
(3)  006662  001410                         BEQ     1$                      ;BR IF YES
(3)  006664  062737  000010  001246         ADD     #10,VTNOW
(3)  006672  012737  002466  002402         MOV     #TST2,WHERE
(3)  006700  000137  002014                 JMP     RSTRT                   ;TEST NEXT ONE
(3)  006704  005737  001100         1$:     TST     $PASS                   ;TEST IF FIRST PASS
(3)  006710  001002                         BNE     2$                      ;BR IF NOT
(3)  006712  104401  020300                 TYPE    ,PASHED                 ;TYPE EOP HEADER
(3)  006716  000005                 2$:     RESET
(3)  006720  005737  001332                 TST     WFTEST          ;TEST IF W.F. MODE
(3)  006724  001402                         BEQ     3$              ;BR IF NOT
(3)  006726  004737  011370                 JSR     PC,ADELAY       ;EXTRA DELAY
(3)  006732  000240                 3$:     NOP
(3)
(1)  006734  005037  001102                 CLR     $TSTNM          ;;ZERO THE TEST NUMBER
(1)  006740  005237  001100                 INC     $PASS           ;;INCREMENT THE PASS NUMBER
(1)  006744  042737  100000  001100         BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
(1)  006752  005327                         DEC     (PC)+           ;;LOOP?
(1)  006754  000001                 $EOPCT: .WORD   1
(1)  006756  003022                         BGT     $DOAGN          ;;YES
(1)  006760  012737                         MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
(1)  006762  000001                 $ENDCT: .WORD   1
(1)  006764  006754                         $EOPCT
(1)  006766  104401  007033                 TYPE    ,$ENDMG         ;;TYPE "END PASS #"
(2)  006772  013746  001100                 MOV     $PASS,-(SP)     ;;SAVE $PASS FOR TYPEOUT
(2)  006776  104405                         TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
(1)  007000  104401  007030                 TYPE    ,$ENULL         ;;TYPE A NULL CHARACTER
(1)  007004  013700  000042         $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
(1)  007010  001405                         BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
(1)  007012  000005                         RESET                   ;;CLEAR THE WORLD
(1)  007014  004710                 $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
(1)  007016  000240                         NOP                     ;;SAVE ROOM
(1)  007020  000240                         NOP                     ;;FOR
(1)  007022  000240                         NOP                     ;;ACT11
(1)  007024                         $DOAGN:
(1)  007024  000137                         JMP     @(PC)+          ;;RETURN
(1)  007026  007050                 $RTNAD: .WORD   NOWEOP
(1)  007030     377     377     000 $ENULL: .BYTE   -1,-1,0         ;;NULL CHARACTER STRING
(1)  007033     015  042412  042116 $ENDMG: .ASCIZ  <15><12>/END PASS #/
(1)  007040  050040  051501  020123
(1)  007046  000043
1609 007050  005737  001274         NOWEOP: TST     PRTCNT
```

```
                                        BPL     11$
                                        DECB    PRTCNT
1612  007062  012737  002466  002402  11$:    MOV     #TST2,WHERE
1613  007070  013746  001112                 MOV     $ERTTL,-(SP)
1614  007074  104405                        TYPDS
1615  007076  104401  007030                 TYPE    ,$ENULL
1616  007102  000137  002006                 JMP     $BEGIN
1620                                  ;;*****************************************************************
(3)                                   ;*TEST 30        X       KEYBOARD OCTAL VALUE LOOP
(3)                                   ;;*****************************************************************
(2)   007106  000004                  TST30:  SCOPE
1621  007110  012706  001100          KRBECO: MOV     #STACK,SP
1622  007114  004537  011442                 JSR     R5,AMSG                 ;DISPLAY HEADER
1623  007120  016202                        MKE
1624  007122  004737  013052          1$:     JSR     PC,GETCHR               ;GET CHAR
1625  007126  000775                        BR      1$                  ;;BR BACK IF NO INPUT
1626  007130  004737  011462                 JSR     PC,OCTAL                ;CONVERT R0 TO OCTAL
1627  007134  113737  011552  016425         MOVB    DIG0,MKEB               ;LOAD DIGIT
1628  007142  113737  011554  016426         MOVB    DIG1,MKEB+1             ;LOAD DIGIT
1629  007150  113737  011556  016427         MOVB    DIG2,MKEB+2             ;LOAD DIGIT
1630  007156  042700  177600                 BIC     #177600,R0
1631  007162  001001                        BNE     10$
1632  007164  005200                        INC     R0
1633  007166  012701  007276          10$:    MOV     #BFCHR,R1               ;LOAD POINTER
1634  007172  121100                  5$:     CMPB    (R1),R0                 ;TEST IF = TO VALUE IN TABLE ?
1635  007174  001403                        BEQ     3$                      ;BR IF FOUND
1636  007176  005721                        TST     (R1)+                   ;MOVE POINTER
1637  007200  001374                        BNE     5$                      ;BR IF MORE
1638  007202  000407                        BR      2$                      ;BR IF NOT IN LIST
1639  007204  062701  000040          3$:     ADD     #BFCHAR-BFCHR,R1        ;UPDATE POINTER
1640  007210  112137  016420                 MOVB    (R1)+,MKEA1             ;LOAD 1ST CHAR
1641  007214  112137  016421                 MOVB    (R1)+,MKEA1+1           ;LOAD 2ND
1642  007220  000420                        BR      4$
1643  007222  120027  000040          2$:     CMPB    R0,#40                  ;TEST IF LESS THAN 40
1644  007226  101010                        BHI     6$                      ;BR IF ABOVE
1645  007230  062700  000100                 ADD     #100,R0                 ;MAKE PRINTABLE
1646  007234  110037  016421                 MOVB    R0,MKEA1+1              ;SAVE CHAR
1647  007240  112737  000136  016420         MOVB    #136,MKEA1              ;ADD A '↑' BEFORE CHARACTER
1648  007246  000405                        BR      4$
1649  007250  112737  000040  016421  6$:     MOVB    #40,MKEA1+1             ;LOAD SPACE
1650  007256  110037  016420                 MOVB    R0,MKEA1                ;LOAD CHARACTER
1651  007262  005237  010666          4$:     INC     IGNORE                  ;IGNORE DOUBLE CHARACTER FLAG
1652  007266  004537  011442                 JSR     R5,AMSG                 ;DISPLAY MESSAGE
1653  007272  016407                        MKEA
1654  007274  000712                        BR      1$                      ;LOOP BACK
1655
1656                                  ;TABLE OF DEFINED CHARACTERS
1657
1658  007276  000007                  BFCHR:  7                               ;BELL CODE
1659  007300  000010                          10                              ;CURSOR LEFT CODE
1660  007302  000011                          11                              ;TAB CODE
1661  007304  000012                          12                              ;LINE FEED CODE
1662  007306  000015                          15                              ;CARRIAGE RETURN CODE
1663  007310  000033                          33                              ;ESCAPE CODE
1664  007312  000040                          40                              ;SPACE CODE
1665  007314  000177                          177                             ;DELETE CODE
```

```
1666  007316  000000                          0
1667  007320  000000                          0
1668  007322  000000                          0
1669  007324  000000                          0
1670  007326  000000                          0
1671  007330  000000                          0
1672  007332  000000                          0
1673  007334  000000                          0
1674
1675                                  ;DEFINED CHARACTER EQUIL
1676
1677  007336  046102                  BFCHAR: .ASCII  /BL/                    ;BELL
1678  007340  046103                          .ASCII  /CL/                    ;CURSOR LEFT
1679  007342  052110                          .ASCII  /HT/                    ;H TAB
1680  007344  043114                          .ASCII  /LF/                    ;LINE FEED
1681  007346  051103                          .ASCII  /CR/                    ;CARIAGE RETURN
1682  007350  051505                          .ASCII  /ES/                    ;ESCAPE
1683  007352  050123                          .ASCII  /SP/                    ;SPACE
1684  007354  042504                          .ASCII  /DE/                    ;DELETE
1685  007356  000000  000000  000000          0,0,0,0,0,0,0,0,0,0
      007364  000000  000000  000000
      007372  000000  000000  000000
      007400  000000
1686                                          .EVEN
1687                                  ;*****************************************************************
                                      ;*TEST 31        Y       KEYBOARD CHARACTER TEST
                                      ;*****************************************************************
                                      ST31:   SCOPE
1688  007402  000004
1688  007404  032737  001000  001260  TSTST:  BIT     #BIT09,VT5XX    ;IS UNIT A VT52?
1689  007412  001403                          BEQ     1$
1690  007414  012703  021012                  MOV     #VS2RW,R3       ;YES-SET UP FOR LOWER CASE CHAR.
1691  007420  000402                          BR      2$
1692  007422  012703  020774          1$:     MOV     #VSORW,R3       ;NO-SET UP FOR UPPER CASE CHAR.
1693  007426  012706  001100          2$:     MOV     #STACK,SP
1694  007432  004537  011442          A:      JSR     R5,AMSG         ;DISPLAY HEADER
1695  007436  014321                          MKB
1696  007440  012302                          MOV     (R3)+,R2        ;LOAD ROW #
1697  007442  032737  001000  001260          BIT     #BIT09,VT5XX    ;UNIT A VT52?
1698  007450  001404                          BEQ     1$              ;NO-USE UPPER CASE KEYBOARD.
1699  007452  004537  011442                  JSR     R5,AMSG         ;ISSUE VT52 ROW1 MESSAGE.
1700  007456  014614                          MKBB2
1701  007460  000403                          BR      2$
1702  007462  004537  011442          1$:     JSR     R5,AMSG
1703  007466  014477                          MKBB                    ;TOP ROW
1704  007470  004737  011560          2$.     JSR     PC,TSTROW       ;CHECK THE ROW
1705
1706  007474  012302                  B:      MOV     (R3)+,R2        ;LOAD ROW #
1707  007476  004537  011442                  JSR     R5,AMSG         ;2ND ROW
1708  007502  014677                          MKBC
1709  007504  004737  011560                  JSR     PC,TSTROW       ;CHECK 2ND ROW
1710
1711  007510  012302                  C:      MOV     (R3)+,R2        ;LOAD ROW #
1712  007512  032737  001000  001260          BIT     #BIT09,VT5XX    ;UNIT A VT52?
1713  007520  001404                          BEQ     1$              ;NO-USE UPPER CASE KEYBOARD.
1714  007522  004537  011442                  JSR     R5,AMSG         ;ISSUE VT52 ROW 3 MESSAGE.
1715  007526  015043                          MKBD2
```

```
1716  007530  000403                          BR      2$
1717  007532  004537  011442          1$:     JSR     R5,AMSG
1718  007536  014736                          MKBD
1719  007540  004737  011560          2$:     JSR     PC,TSTROW       ;CHECK ROW 3
1720
1721  007544  012302                          MOV     (R3)+,R2        ;LOAD ROW #
1722  007546  004537  011442                  JSR     R5,AMSG
1723  007552  015131                          MKBE
1724  007554  004737  011560                  JSR     PC,TSTROW       ;CHECK ROW 4
1725
1726  007560  012702  021176                  MOV     #ROW5,R2
1727  007564  004537  011442                  JSR     R5,AMSG
1728  007570  015251                          MKBF
1729  007572  004737  011560                  JSR     PC,TSTROW       ;CHECK ROW 5
1730
1731                                  ;TEST THE "LEFT"-SHIFT KEY
1732
1733  007576  004537  011442          D:      JSR     R5,AMSG         ;DEPRESS THE "LEFT-SHIFT" KEY
1734  007602  015307                          MKBG
1735  007604  012302                          MOV     (R3)+,R2        ;LOAD ROW 1 SHIFTED TABLE
1736  007606  032737  001000  001260          BIT     #BIT09,VTSXX    ;UNIT A VT52?
1737  007614  001404                          BEQ     1$              ;NO-USE UPPER CASE KEYBOARD.
1738  007616  004537  011442                  JSR     R5,AMSG         ;ISSUE VT52 ROW1 MESSAGE.
1739  007622  014614                          MKBB2
1740  007624  000403                          BR      2$
1741  007626  004537  011442          1$:     JSR     R5,AMSG         ;TEST ROW 1
1742  007632  014477                          MKBB
1743  007634  004737  011560          2$:     JSR     PC,TSTROW       ;TEST THE ROW
1744  007640  004537  011442                  JSR     R5,AMSG         ;RELEASE THE SHIFT KEY
1745  007644  014355                          MKB.
1746
1747                                  ;TEST THE "RIGHT-SHIFT" KEY
1748
1749  007646  004537  011442          E:      JSR     R5,AMSG         ;SET THE "RIGHT-SHIFT" KEY
1750  007652  015356                          MKBGA
1751  007654  012302                          MOV     (R3)+,R2        ;LOAD TABLE POINTER
1752  007656  032737  001000  001260          BIT     #BIT09,VTSXX    ;UNIT A VT52?
1753  007664  001404                          BEQ     1$              ;NO-USE UPPER CASE KEYBOARD.
1754  007666  004537  011442                  JSR     R5,AMSG         ;ISSUE VT52 ROW1 MESSAGE.
1755  007672  014614                          MKBB2
1756  007674  000403                          BR      2$
1757  007676  004537  011442          1$:     JSR     R5,AMSG
1758  007702  014477                          MKBB
1759  007704  004737  011560          2$:     JSR     PC,TSTROW       ;TEST THE ROW AGAIN WITH THE RIGHT-SHIFT SET
1760  007710  004537  011442                  JSR     R5,AMSG
1761  007714  014355                          MKB1                    ;RELEASE SKIFT KEY
1762                                  ;TEST THE CONTROL MODE
1763
1764  007716  004537  011442          F:      JSR     R5,AMSG         ;SET CTRL
1765  007722  015426                          MKBH
1766  007724  012302                          MOV     (R3)+,R2        ;LOAD ROW 1 CTRL TABLE
1767  007726  032737  001000  001260          BIT     #BIT09,VTSXX    ;UNIT A VT52?
1768  007734  001404                          BEQ     1$              ;NO-USE UPPER CASE KEYBOARD.
1769  007736  004537  011442                  JSR     R5,AMSG         ;ISSUE VT52 ROW1 MESSAGE.
1770  007742  014614                          MKBB2
1771  007744  000403                          BR      2$
```

```
1772  007746  004537  011442          1$:   JSR     R5,AMSG
1773  007752  014477                        MKBB
1774  007754  004737  011560          2$:   JSR     PC,TSTROW       ;TEST THE ROW
1775
1776                                  ;KEYPAD TEST FOR VT50H AND VT52
1777
1778  007760  032737  010000  001260        BIT     #BIT12,VT5XX            ;VT50H EXTRA KEYPAD?
1779  007766  001436                        BEQ     KRBDON                  ;NO EXIT TEST
1780  007770  004537  011442                JSR     R5,AMSG                 ;TYPE TEST ID
1781  007774  015700                        MKBN
1782  007776  004537  011442                JSR     R5,AMSG                 ;TYPE INSTRUCTIONS
1783  010002  022046                        INSTR
1784  010004  012702  021602                MOV     #KPTAB,R2               ;SET TABLE POINTER
1785  010010  004737  012164                CALL    TSTKPS                  ;DO THE TEST
1786  010014  032737  001000  001260        BIT     #1000,VT5XX             ;IS UUT VT52?
1787  010022  001420                        BEQ     KRBDON                  ;NO EXIT TEST
1788  010024  004537  011442                JSR     R5,AMSG                 ;TYPE TEST ID
1789  010030  015727                        MKBS2
1790  010032  004537  011442                JSR     R5,AMSG                 ;TYPE INSTRUCTIONS
1791  010036  022046                        INSTR
1792  010040  004537  011442                JSR     R5,AMSG                 ;ENTER ALT-MODE
1793  010044  021543                        ENAKP
1794  010046  012702  021660                MOV     #AKPTAB,R2              ;SET TABLE POINTER
1795  010052  004737  012164                CALL    TSTKPS                  ;DO THE TEST
1796  010056  004537  011442                JSR     R5,AMSG                 ;EXIT ALT-MODE
1797  010062  021550                        EXAKP
1798                                  ;COMPLETION OF KEYBOARD-KEYPAD TEST
1799
1800  010064  004537  011442          KRBDON: JSR     R5,AMSG         ;END OF KEYBOARD TEST
1801  010070  016066                        MKBR
1802  010072  000137  007404                JMP     KRBTST          ;LOOP
1803                                  ;;*****************************************************************
  3                               ;;*TEST 32       Z       KEYBOARD ECHO LOOP
 (3)                              ;;*****************************************************************
 (2)  010076  000004                  TST32:  SCOPE
1804  010100  012706  001100          KRBECH: MOV     #STACK,SP
1805  010104  004537  011442                  JSR     R5,AMSG         ;DISPLAY HEADER
1806  010110  016434                          MKEH
1807
1808  010112  004737  013052          1$:     JSR     PC,GETCHR       ;GET CHARACTER
1809  010116  000775                          BR      1$
1810  010120  110077  171160                  MOVB    R0,@VTOB        ;LOAD THE CHARACTER
1811  010124  105777  171152          2$:     TSTB    @VTOS           ;WAIT FOR DONE
1812  010130  100375                          BPL     2$
1813  010132  000767                          BR      1$              ;LOOP BACK
1817
1818                                  ;LOAD A SINGLE CHARACTER ACROSS THE SCREEN WIDTH
1819                                  ;
1820
1821  010134  013702  001320          FILBUF: MOV     WIDTH,R2        ;LOAD WIDTH VALUE
1822  010140  012700  025256          FILBFB: MOV     #BUFFER,R0      ;SET-UP BUFFER POINTER
1823  010144  112720  000015                  MOVB    #15,(R0)+       ;LOAD 'CR'
1824  010150  112720  000012                  MOVB    #12,(R0)+       ;LOAD 'FL'
1825  010154  110120                  FILBFA: MOVB    R1,(R0)+        ;SAVE THE CHARACTER IN THE BUFFER
1826  010156  005302                          DEC     R2              ;FINISHED?
1827  010160  001375                          BNE     FILBFA          ;BRANCH IF NOT COMPLETED
```

```
 1828  010162  112710  000377            MOVB    #377,(R0)       ;LOAD TERM.
 1829  010166  000207                    RTS     PC              ;EXIT
 1830
 1831                                ;LOAD A INCREMENTING CHARACTER ACROSS THE SCREEN WIDTH
 1832                                ;ONLY 40 THRU 177 ARE LEGAL CHARACTERS
 1833
 1834  010170  012700  025256    LIC:    MOV     #BUFFER,R0      ;SET-UP BUFFER POINTER
 1835  010174  013502                    MOV     @(5)+,R2        ;SET-UP WIDTH
 1836  010176  112720  000015            MOVB    #15.,(R0)+      ;LOAD 'CR'
 1837  010202  112720  000012            MOVB    #12.,(R0)+      ;LOAD 'LF'
 1838  010206  110120            LICA:   MOVB    R1,(0)+         ;SAVE A CHARACTER IN THE BUFFER
 1839  010210  005201                    INC     R1              ;UPDATE THE CHARACTER
 1840  010212  023701  001310            CMP     LASTCH,R1       ;TEST FOR
 1841  010216  001002                    BNE     LICB            ;BRANCH IF NOT
 1842  010220  012701  000040            MOV     #40,R1          ;MAKE A LEGAL CHARACTER
 1843  010224  005302            LICB:   DEC     R2              ;DECREMENT COUNT
 1844  010226  001367                    BNE     LICA            ;BRANCH IF NOT COMPLETED
 1845  010230  112710  000377            MOVB    #377,(R0)       ;LOAD TERM
 1846  010234  000205                    RTS     R5              ;EXIT
 1847
 1848                                ;DISPLAY SUBROUTINE
 1849
 1850  010236  012700  025256    XPRNT:  MOV     #BUFFER,R0      ;SETUP BUFFER POINTER
 1851  010242  105777  171034    XPRNTA: TSTB    @VTOS           ;TEST READY
 1852  010246  100404                    BMI     XPRNTB          ;BRANCH IF SET
 1853  010250  005777  171026            TST     @VTOS           ;TEST ERROR
 1854  010254  100372                    BPL     XPRNTA          ;BRANCH IF RESET
 1855  010256  104001                    ERROR   1               ;ERROR FLAG SET ON TRANSMITTER STATUS
 1856  010260  112001            XPRNTB: MOVB    (0)+,R1
 1857  010262  100563                    BMI     1$              ;BR IF MINUS
 1858  010264  122701  000033    5$:     CMPB    #33,R1          ;TEST FOR ESC
 1859  010270  001003                    BNE     3$              ;BR IF NOT
 1860  010272  005237  010664            INC     ANESC           ;SET SOFT FLAG
 1861  010276  000402                    BR      4$
 1862  010300  005037  010664    3$:     CLR     ANESC           ;CLEAR SOFT FLAG
 1863  010304  110177  170774    4$:     MOVB    R1,@VTOB        ;LOAD CHAR
 1864  010310  105777  170762            TSTB    @VTIS           ;TEST INPUT FLAG
 1865  010314  100352                    BPL     XPRNTA          ;BR IF CLEARED
 1866  010316  005737  010664            TST     ANESC           ;TEST IF ESC
 1867  010322  001347                    BNE     XPRNTA
 1868  010324  013737  001254  013124  52$:     MOV     TIME0,TIME1
 1869  010332  005037  013126            CLR     TIME2           ;LOAD DELAY
 1870  010336  105777  170734    2$:     TSTB    @VTIS           ;TEST IF INPUT FLAG
 1871  010342  100407                    BMI     53$             ;BR IF SET
 1872  010344  005337  013126            DEC     TIME2           ;DELAY
 1873  010350  001372                    BNE     2$
 1874  010352  005337  013124            DEC     TIME1           ;DELAY
 1875  010356  001367                    BNE     2$
 1876  010360  000440                    BR      60$             ;REPORT ERROR
 1877  010362  005737  010666    53$:    TST     IGNORE          ;IGNORE KEYBOARD CHARACTERS *
 1878  010366  001104                    BNE     15$             ;BR IF YES
 1879  010370  017737  170704  001126    MOV     @VTIB,$BDDAT    ;READ CHAR
 1880  010376  042737  177600  001126    BIC     #177600,$BDDAT  ;MASK
 1881  010404  022737  000021  001126    CMP     #XON,$BDDAT     ;TEST FOR X ON
 1882  010412  001003                    BNE     50$
 1883  010414  005237  010662            INC     XONRC           ;SET FLAG
```

```
1884  010420  000710                          BR      XPRNTA          ;START AGAIN
1885  010422  022737  000023  001126  50$:    CMP     #XOFF,$BDDAT    ;TEST FOR X OFF
1886  010430  001020                          BNE     51$             ;BR IF NOT
1887  010432  005237  010660                  INC     XOFFRC
1888  010436  005737  010654                  TST     XOFFOK          ;XOFF ENABLED ?
1889  010442  001730                          BEQ     52$
1890  010444  012737  000001  010656          MOV     #1,AXOFF        ;SET X OFF SOFT FLAG
1891  010452  005737  010652                  TST     XOFFBR          ;TEST
1892  010456  001271                          BNE     XPRNTA          ;BR BACK
1893  010460  000721                          BR      52$             ;BR
1894  010462  012737  000000  001124  60$:    MOV     #0,$GDDAT
1895  010470  000437                          BR      13$
1896  010472  105777  170442          51$:    TSTB    @$SWR           ;TEST SWR
1897  010476  100371                          BPL     60$             ;BR IF CLEARED
1898  010500  012737  000057  001124          MOV     #'/,$GDDAT      ;LOAD EXPECTED
1899  010506  023737  001124  001126          CMP     $GDDAT,$BDDAT   ;COMPARE
1900  010514  001437                          BEQ     14$             ;BR IF EQUAL
1901  010516  012737  000134  001124          MOV     #'\,$GDDAT      ;LOAD EXPECTED
1902  010524  023737  001124  001126          CMP     $GDDAT,$BDDAT   ;COMPARE
1903  010532  001016                          BNE     13$             ;BR IF NOT
1904
1905                                  ;"\" OR LOOP EXIT
1906
1907  010534  012737  000001  010650          MOV     #1,LOOP         ;SET SOFT FLAG
1908  010542  012737  017556  010706          MOV     #MQ0,FINDTA     ;SETUP MESSAGE
1909  010550  005037  010652          16$:    CLR     XOFFBR
1910  010554  005037  010654                  CLR     XOFFOK
1911  010560  005037  010666                  CLR     IGNORE
1912  010564  000137  010676                  JMP     FINDOT
1913
1914  010570  005737  010666          13$:    TST     IGNORE          ;IGNORE INPUT CHARACTER
1915  010574  001001                          BNE     15$
1916  010576  104004                          ERROR   4               ;UNEXPECTED OR INCORRECT INPUT FLAG
1917  010600  000240                  15$:    NOP
1918  010602  000240                          NOP
1919  010604  000240                          NOP
1920  010606  000240                          NOP
1921  010610  000137  010242                  JMP     XPRNTA
1922
1923                                  ;"/" OR STANDARD EXIT
1924
1925  010614  005037  010650          14$:    CLR     LOOP
1926  010620  012737  017643  010706          MOV     #MQ1,FINDTA     ;SETUP MESSAGE
1927  010626  000137  010550                  JMP     16$
1928
1929                                  ;NORMAL EXIT
1930
1931  010632  005037  010654          1$:     CLR     XOFFOK
1932  010636  005037  010666                  CLR     IGNORE
1933  010642  005037  010652                  CLR     XOFFBR
1934  010646  000207                          RTS     PC              ;EXIT
1935
1936  010650  000000                  LOOP:   0
1937  010652  000000                  XOFFBR: 0
1938  010654  000000                  XOFFOK: 0
1939  010656  000000                  AXOFF:  0
```

```
010660  000000                  XOFFRC: 0
010662  000000                  XONRC:  0
010664  000000                  AMESC:  0
010666  000000                  IGNORE: 0               ;WHEN SET IGNORE KEYBOARD FLAGS

                                ;DETERMINE THE  TEST TO GO TO
010670  004537  011442          FNDA:   JSR     R5,AMSG
010674  017731                          MQ2                     ;ERROR ASK AGAIN
010676  012706  001100          FINDOT: MOV     #STACK,SP
010702  004537  011442                  JSR     R5,AMSG
010706  017643                  FINDTA: MQ1
010710  004737  013052                  JSR     PC,GETCHR
010714  000770                          BR      FINDOT
010716  042700  100600                  BIC     #100600,R0      ;MASK
010722  122700  000101                  CMPB    #'A,R0          ;TEST FOR NUMBER
010726  101360                          BHI     FNDA
010730  122700  000132                  CMPB    #'Z,R0          ;TEST FOR OTHERS
010734  103755                          BLO     FNDA
010736  042700  177740                  BIC     #177740,R0      ;MAKE 0-32
010742  005300                          DEC     R0
010744  110037  001102                  MOVB    R0,$TSTNM       ;LOAD THAT TEST #
010750  006300                          ASL     R0
010752  005760  010776                  TST     DSPCH(R0)       ;TEST IF VALID
010756  001744                          BEQ     FNDA                    ;BR IF NOT
010760  000240                          NOP
010762  000240                          NOP
010764  016037  010776  001106          MOV     DSPCH(R0),$LPADR        ;LOAD LOOP ADDRESS
010772  000170  010776                  JMP     @DSPCH(R0)      ;GO TO THAT TEST

                                ;SUBTEST DISPATCH TABLE

010776  002044                  DSPCH:  TST1+2
011000  002470                          TST2+2
011002  002510                          TST3+2
011004  002564                          TST4+2
011006  002664                          TST5+2
011010  002766                          TST6+2
011012  003430                          TST7+2
011014  004000                          TST10+2
011016  004156                          TST11+2
011020  004304                          TST12+2
011022  004342                          TST13+2
011024  005102                          TST14+2
011026  005252                          TST15+2
011030  005364                          TST16+2
011032  005534                          TST17+2
011034  005570                          TST20+2
011036  005660                          TST21+2
011040  006012                          TST22+2
011042  006146                          TST23+2
011044  006270                          TST24+2
011046  006346                          TST25+2
011050  006460                          TST26+2
011052  006514                          TST27+2
011054  007110                          TST30+2
011056  007404                          TST31+2
```

```
                                        ;SUBROUTINE TO LOAD COPIER TEST
011060  012700  025256          FIRLST: MOV     #BUFFER,R0
011064  112720  000015                  MOVB    #15.,(R0)+      ;LOAD CR
011070  112720  000012                  MOVB    #12.,(R0)+      ;LOAD LF
011074  112720  000105                  MOVB    #'E,(R0)+
011100  112720  000105                  MOVB    #'E,(R0)+
011104  112720  000105                  MOVB    #'E,(R0)+
011110  013702  001320                  MOV     WIDTH,R2        ;LOAD WIDTH
011114  163702  001270                  SUB     #14,R2
011120  005302                          DEC     R2
011122  112720  000040          1$:     MOVB    #40,(R0)+       ;LOAD A SPACE
011126  005302                          DEC     R2              ;DONE ?
011130  100374                          BPL     1$              ;BR UNTIL DONE
011132  112720  000105                  MOVB    #'E,(R0)+
011136  112720  000105                  MOVB    #'E,(R0)+
011142  112720  000105                  MOVB    #'E,(R0)+       ;LOAD 80 TH
011146  112710  000377                  MOVB    #377,(R0)       ;LOAD TERM
011152  000207                          RTS     PC              ;EXIT

                                        ;SUBROUTINE FOR THE DATA PATH TEST

011154  012700  025256          DTPSR:  MOV     #BUFFER,R0
011160  012501                  DTPSRB: MOV     (5)+,R1         ;GET FIRST CHARACTER
011162  012502                          MOV     (5)+,R2         ;GET SECOND CHARACTER
011164  013703  001320                  MOV     WIDTH,R3                ;SET THE WIDTH
011170  006203                          ASR     R3              ;DIVIDE BY 2
011172  112720  000015                  MOVB    #15.,(R0)+      ;LOAD 'CR'
011176  112720  000012                  MOVB    #12.,(R0)+      ;LOAD 'LF'
011202  110120                  DTPSRA: MOVB    R1,(0)+         ;
011204  110220                          MOVB    R2,(0)+
011206  005303                          DEC     R3
011210  100374                          BPL     DTPSRA
011212  112710  000377                  MOVB    #377,(R0)       ;LOAD TERM
011216  000205                          RTS     R5

                                        ;SUBROUTINE TO LOAD BUFFER WITH GRAPHICS CHARACTERS

011220  012700  025256          GBBUF:  MOV     #BUFFER,R0      ;LOAD BUFFER ADDRESS
011224  012701  000136                  MOV     #136,R1         ;LOAD INITIAL CHAR.
011230  010402                          MOV     R4,R2           ;LOAD BUFFER COUNT
011232  110120                  1$:     MOVB    R1,(R0)+        ;INSERT A CHAR. IN THE BUFFER
011234  005201                          INC     R1              ;INCREMENT CHAR.
011236  122701  000177                  CMPB    #177,R1         ;AT END OF GRAPHICS STRING?
011242  001002                          BNE     2$              ;NO
011244  012701  000136                  MOV     #136,R1         ;YES-RESET IT TO 1ST GRAPH. CHAR.
011250  005302                  2$:     DEC     R2              ;DECREMENT BUFFER COUNT.
011252  001367                          BNE     1$              ;NOT AT END-LOOP
011254  112710  000377                  MOVB    #377,(R0)       ;END OF BUFFER-INSERT TERMINATOR
011260  000207                          RTS     PC              ;AND EXIT.

                                        ;PROGRAM DELAY ROUTINE

011262  013737  001256  011364  DELAY:  MOV     SUBTST,10$      ;LOAD COUNT
011270  005037  011366                  CLR     11$
011274  005737  001332                  TST     WFTEST          ;TEST IF W.F. MODE
```

```
2052  011300  001413                        BEQ     2$              ;BR IF NOT
2053  011302  006237  011364                ASR     10$             ;CHANGE DELAY TIMER
2054  011306  006237  011364                ASR     10$
2055  011312  006237  011364                ASR     10$
2056  011316  000240                        NOP
2057  011320  000240                        NOP
2058  011322  000240                        NOP
2059  011324  000240                        NOP
2060  011326  000240                        NOP
2061  011330  032777  010000  167602  2$:   BIT     #BIT12,@SWR     ;TEST SR
2062  011336  001006                        BNE     3$              ;BR IF SET
2063  011340  005337  011366                DEC     11$             ;DELAY
2064  011344  001371                        BNE     2$
2065  011346  005337  011364                DEC     10$
2066  011352  100366                        BPL     2$              ;DELAY
2067  011354  000240                3$:     NOP
2068  011356  000240                        NOP
2069  011360  000240                        NOP
2070  011362  000207                        RTS     PC              ;EXIT
2071
2072  011364  000002                10$:    2
2073  011366  000000                11$:    0
2074
2075  011370  013737  001256  011436  ADELAY: MOV     SUBTST,10$
2076  011376  005037  011440                CLR     11$
2077  011402  006237  011436                ASR     10$
2078  011406  006237  011436                ASR     10$
2079  011412  005337  011440          2$:   DEC     11$
2080  011416  001375                        BNE     2$
2081  011420  005337  011436                DEC     10$
2082  011424  100372                        BPL     2$
2083  011426  000240                        NOP
2084  011430  000240                        NOP
2095  011432  000240                        NOP
2086  011434  000207                        RTS     PC
2087  011436  000000                10$:    0
2088  011440  000000                11$:    0
2089
2090
2091                                  ;HEADER SUBROUTINE FOR VT-50
2092
2093  011442  012537  011452          AMSG:   MOV     (R5)+,10$       ;GET POINTER
2094  011446  004537  013130          1$:     JSR     R5,MTOB         ;MOVE TO BUFFER
2095  011452  000000                10$:    0
2096  011454  004737  010236          11$:    JSR     PC,XPRNT        ;DISPLAY IT
2097  011460  000205                        RTS     R5              ;EXIT
2098
2099
2100                                  ;OCTAL - 3 BIT CONVERSION
2101
2102  011462  010001                OCTAL:  MOV     R0,R1           ;LOAD R1
2103  011464  042701  177770                BIC     #177770,R1      ;MASK
2104  011470  062701  000060                ADD     #60,R1
2105  011474  110137  011556                MOVB    R1,DIG2         ;SAVE LSD
2106  011500  010001                        MOV     R0,R1
2107  011502  006001                        ROR     R1
```

```
2108  011504  006001                        ROR     R1
2109  011506  006001                        ROR     R1
2110  011510  042701  177770                BIC     #177770,R1
2111  011514  062701  000060                ADD     #60,R1
2112  011520  110137  011554                MOVB    R1,DIG1         ;SAVE IT
2113  011524  010001                        MOV     R0,R1
2114  011526  006101                        ROL     R1
2115  011530  006101                        ROL     R1
2116  011532  000301                        SWAB    R1
2117  011534  042701  177770                BIC     #177770,R1
2118  011540  062701  000060                ADD     #60,R1
2119  011544  110137  011552                MOVB    R1,DIG0         ;SAVE MSD
2120  011550  000207                        RTS     PC              ;EXIT
2121
2122  011552  000000              DIG0:     0
2123  011554  000000              DIG1:     0
2124  011556  000000              DIG2:     0
2125
2126                                ;SUBROUTINE FOR THE KEYBOARD CHARACTER TEST
2130  011560  004537  011442      TSTROW: JSR     R5,AMSG         ;DISPLAY HEADER
2131  011564  014410                        MKBA'
2132  011566  004737  013052      1$:       CALL    GETCHR          ;GET A CHARACTER
2133  011572  000775                        BR      1$              ;WAIT FOR INPUT
2134  011574  004737  011772                CALL    PARITY          ;ADJUST CHAR IF PARITY
2135  011600  120037  011762                CMPB    R0,100$         ;CMP EXPCT AND RCVD
2136  011604  001003                        BNE     2$              ;TYPE ERROR INFO
2137  011606  005722                        TST     (R2)+
2138  011610  100366                        BPL     1$              ;LOOP TILL DONE
2139  011612  000207                        RETURN                  ;EXIT TEST
2140
2141                                ;COME HERE IF EXPECTED NOT EQUAL TO RECVD
2142                                ;CONVERT RESULTS TO OCTAL FOR TYPEOUT
2143
2144  011614  010037  001126      2$:       MOV     R0,$BDDAT       ;LOAD BAD CHARACTER
2145  011620  004737  011462                JSR     PC,OCTAL        ;CONVERT TO OCTAL
2146  011624  113737  011552  016057        MOVB    DIG0,MKBQB      ;LOAD OCTAL #
2147  011632  113737  011554  016060        MOVB    DIG1,MKBQB+1
2148  011640  113737  011556  016061        MOVB    DIG2,MKBQB+2
2149  011646  042700  177600                BIC     #177600,R0
2150  011652  120027  000040                CMPB    R0,#40          ;TEST IF PRINTABLE
2151  011656  101002                        BHI     10$             ;BR IF PRINTABLE
2152  011660  112700  000056                MOVB    #56,R0          ;CONVERT TO A "#" CHARACTER
2153  011664  110037  016053      10$:      MOVB    R0,MKBQ2        ;SAVE CHAR
2154  011670  011200                        MOV     (R2),R0         ;GET GOOD CHAR
2155  011672  053700  011770                BIS     MASK2,R0
2156  011676  010037  001124                MOV     R0,$GDDAT       ;LOAD GOOD CHARACTER
2157  011702  004737  011462                JSR     PC,OCTAL        ;CONVERT IT
2158  011706  113737  011552  016040        MOVB    DIG0,MKBQA      ;LOAD DIGIT
2159  011714  113737  011554  016041        MOVB    DIG1,MKBQA+1
2160  011722  113737  011556  016042        MOVB    DIG2,MKBQA+2
2161  011730  042700  177600                BIC     #177600,R0
2162  011734  110037  016034                MOVB    R0,MKBQ1        ;SAVE CHAR
2163  011740  023737  001276  001144        CMP     VTIS,$TKS       ;TEST IF ON C-Y
2164  011746  001403                        BEQ     3$              ;BR IF YES
2165  011750  004537  011442                JSR     R5,AMSG         ;DISPLAY ERROR  MESSAGE
2166  011754  015773                        MKBQ
```

```
2167  011756  104004                    3$:     ERROR   4               ;CHARACTER RECVD NOT EQUAL TO EXPECTED
2168  011760  000702                            BR      1$              ;BR BACK AND TEST THE CHARACTER AGAIN
2169
2170  011762  000000                    100$:   0
2171  011764  000000                    101$:   0
2172  011766  177600                    MASK1:  177600
2173  011770  000000                    MASK2:  0
2174
2175                                    ;TEST TO ADD PARITY TO EXPCTD CHAR
2176  011772  012737  177600  011766    PARITY: MOV     #177600,MASK1
2177  012000  005037  011770                    CLR     MASK2
2178  012004  032777  000004  167126            BIT     #BIT2,@SWR      ;TEST SWR
2179  012012  001416                            BEQ     4$              ;DO NOT TEST PARITY BIT
2180  012014  042737  000200  011766            BIC     #BIT7,MASK1     ;ENABLE PARITY BIT
2181  012022  032777  000002  167110            BIT     #BIT1,@SWR      ;TEST IF FORCED PARITY
2182  012030  001417                            BEQ     5$              ;BR IF NOT FORCED PARITY BIT
2183  012032  032777  000001  167100            BIT     #BIT0,@SWR      ;TEST FOR EVEN/ODD PARITY
2184  012040  001403                            BEQ     4$              ;BR IF ALLWAYS OFF
2185  012042  052737  000200  011770            BIS     #BIT7,MASK2     ;SET BIT 7
2186  012050  111237  011762            4$:     MOVB    (R2),100$       ;GET EXPECTED
2187  012054  053737  011770  011762            BIS     MASK2,100$      ;SET BIT 7 IF EXPECTED
2188  012062  043700  011766                    BIC     MASK1,R0        ;MASK VALUE READ
2189  012066  000207                            RETURN                  ;EXIT ROUTINE
2190  012070  005037  011764            5$:     CLR     101$            ;CLEAR TEMP
2191  012074  111237  011762                    MOVB    (R2),100$       ;CLEAR CHAR SAVE
2192  012100  006037  011762            20$:    ROR     100$            ;ROTATE CHAR
2193  012104  103002                            BCC     21$             ;BR IF NO CARRY
2194  012106  005237  011764                    INC     101$            ;UPDATE CNT
2195  012112  105737  011762            21$:    TSTB    100$            ;DONE ?
2196  012116  001370                            BNE     20$             ;BR IF NOT
2197  012120  032777  000001  167012            BIT     #BIT0,@SWR      ;TEST EVEN/ODD
2198  012126  001407                            BEQ     23$             ;BR IF OPER. SAYS EVEN
2199  012130  006037  011764                    ROR     101$            ;
2200  012134  103403                            BCS     22$             ;BR IF ODD ALREADY
2201  012136  052737  000200  011770            BIS     #BIT7,MASK2     ;SET PARITY BIT
2202  012144  000741                    22$:    BR      4$              ;BR TO TEST CHAR
2203  012146  006037  011764            23$:    ROR     101$            ;
2204  012152  103003                            BCC     24$             ;BR IF EVEN ALREADY
2205  012154  052737  000200  011770            BIS     #BIT7,MASK2
2206  012162  000732                    24$:    BR      4$              ;BR TO TEST CHAR
2207
2208                                    ;ROUTINE TO TEST THE KEYPAD INPUTS
2209  012164                            ↑STKPS:
  (2) 012164  010146                            MOV     R1,-(SP)        ;;PUSH R1 ON STACK
  (2) 012166  010346                            MOV     R3,-(SP)        ;;PUSH R3 ON STACK
  (2) 012170  010446                            MOV     R4,-(SP)        ;;PUSH R4 ON STACK
  (2) 012172  010546                            MOV     R5,-(SP)        ;;PUSH R5 ON STACK
2210  012174  012701  025234            71$:    MOV     #GOOD,R1        ;SETUP POINTERS TO DATA
2211  012200  012703  025214                    MOV     #HOLD,R3
2212  012204  010237  025254                    MOV     R2,RETRY
2213  012210  004737  013052            72$:    CALL    GETCHR          ;GET INPUT
2214  012214  000775                            BR      72$             ;LOOP IF NONE
2215  012216  004737  011772                    CALL    PARITY          ;ADD PARITY IF NECESSARY
2216  012222  110023                            MOVB    R0,(R3)+                ;PUT RCVD IN HOLD
2217  012224  113721  011762                    MOVB    100$,(R1)+      ;PUT EXPCTD IN GOOD
2218  012230  105722                            TSTB    (R2)+           ;BUMP POINTER
```

```
2219  012232  121227  000377                  CMPB    (R2),#377       ;DONE WITH KEY YET
2220  012236  001364                          BNE     72$             ;GET REST OF KEY
2221  012240  111213                          MOVB    (R2),(R3)       ;PUT ON DELIMITER
2222  012242  112211                          MOVB    (R2)+,(R1)
2223  012244  004737  012270                  CALL    TSTDAT          ;COMPARE THE KEY VALUES
2224  012250  105712                          TSTB    (R2)            ;END OF TABLE YET
2225  012252  001401                          BEQ     73$             ;EXIT TEST
2226  012254  000747                          BR      71$             ;NEXT KEY
2227  012256                          73$:
  (2) 012256  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
  (2) 012260  012604                          MOV     (SP)+,R4        ;;POP STACK INTO R4
  (2) 012262  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
  (2) 012264  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
2228  012266  000207                          RETURN
2229
2230                                  ;ROUTINE TO COMPARE EXPECTED AND RECEIVED KEY VALUES
2231                                  ;FOR THE KEYPAD TESTS
2232  012270  012703  025214          TSTDAT: MOV     #HOLD,R3        ;SET DATA POINTERS
2233  012274  012701  025234                  MOV     #GOOD,R1
2234  012300  010305                          MOV     R3,R5
2235  012302  010104                          MOV     R1,R4
2236  012304  121127  000377          75$:    CMPB    (R1),#377       ;DELIMITER YET
2237  012310  001432                          BEQ     74$             ;EXIT ROUTINE
2238  012312  122123                          CMPB    (R1)+,(R3)+     ;COMPR EXPCTD AND RCVD
2239  012314  001773                          BEQ     75$
2240  012316  013702  025254                  MOV     RETRY,R2        ;WE HAVE AN ERROR SOMEWHERE
2241  012322  005237  010666                  INC     IGNORE
2242  012326  004537  011442                  JSR     R5,AMSG         ;TYPE ERROR INFPO
2243  012332  022025                          ERCHR
2244  012334  005237  010666                  INC     IGNORE
2245  012340  004537  011442                  JSR     R5,AMSG
2246  012344  021766                          SHBE
2247  012346  004737  012400                  CALL    OUTPUT
2248  012352  005237  010666                  INC     IGNORE
2249  012356  004537  011442                  JSR     R5,AMSG
2250  012362  022014                          AWAS
2251  012364  010504                          MOV     R5,R4
2252  012366  004737  012400                  CALL    OUTPUT
2253  012372  105777  166702                  TSTB    @VTIB           ;CLEAR ANY UNPREDICTED GARBAGE
2254  012376  000207                  74$:    RETURN
2255
2256                                  ;ROUTINE TO OUTPUT GOOD AND BAD KEYPAD OCTAL VALUES ON SCREEN
2257  012400                          OUTPUT:
  (2) 012400  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
2258  012402  005001                          CLR     R1
2259  012404  112761  000040  021777  77$:    MOVB    #40,OUT(R1)     ;FILL AREA WITH SPACES
2260  012412  005201                          INC     R1
2261  012414  120127  000013                  CMPB    R1,#13          ;FULL YET
2262  012420  001371                          BNE     77$
2263  012422  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
2264  012424  112400                          MOVB    (R4)+,R0        ;SETUP KEY VALUE TO CONVERT
2265  012426  004737  011462                  CALL    OCTAL           ;DO IT
2266  012432  113737  011552  021777          MOVB    DIG0,OUT
2267  012440  113737  011554  022000          MOVB    DIG1,OUT+1
2268  012446  113737  011556  022001          MOVB    DIG2,OUT+2
2269  012454  121427  000377                  CMPB    (R4),#377       ;DELIMITER
```

```
 2270  012460  001433                        BEQ     76$             ;EXIT
 2271  012462  112400                        MOVB    (R4)+,R0        ;SETUP 2ND VALUE OF KEY
 2272  012464  004737  011462                CALL    OCTAL           ;GO IT
 2273  012470  113737  011552  022003        MOVB    DIG0,OUT+4
 2274  012476  113737  011554  022004        MOVB    DIG1,OUT+5
 2275  012504  113737  011556  022005        MOVB    DIG2,OUT+6
 2276  012512  121427  000377                CMPB    (R4),#377       ;DELIMITER ?
 2277  012516  001414                        BEQ     76$             ;EXIT
 2278  012520  112400                        MOVB    (R4)+,R0        ;SETUP 3RD VALUE OF KEY
 2279  012522  004737  011462                CALL    OCTAL
 2280  012526  113737  011552  022007        MOVB    DIG0,OUT+10
 2281  012534  113737  011554  022010        MOVB    DIG1,OUT+11
 2282  012542  113737  011556  022011        MOVB    DIG2,OUT+12
 2283  012550  005237  010666        76$:    INC     IGNORE
 2284  012554  004537  011442                JSR     R5,AMSG         ;OUTPUT VALUES ON SCREEN
 2285  012560  021777                        OUT
 2286  012562  000207                        RETURN
 2287
 2291
 2292                                .SBTTL  CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
  (1)
  (2)                               ;;**********************************************************************
  (1)                               ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 5-DIGIT
  (1)                               ;*SIGNED DECIMAL (ASCII) NUMBER AND TYPE IT. DEPENDING ON WHETHER THE
  (1)                               ;*NUMBER IS POSITIVE OR NEGATIVE A SPACE OR A MINUS SIGN WILL BE TYPED
  (1)                               ;*BEFORE THE FIRST DIGIT OF THE NUMBER. LEADING ZEROS WILL ALWAYS BE
  (1)                               ;*REPLACED WITH SPACES.
  (1)                               ;*CALL:
  (1)                               ;*      MOV     NUM,-(SP)       ;;PUT THE BINARY NUMBER ON THE STACK
  (1)                               ;*      TYPDS                   ;;GO TO THE ROUTINE
  (1)
  (1)   012564                      $TYPDS:
  (3)   012564  010046                      MOV     R0,-(SP)        ;;PUSH R0 ON STACK
  (3)   012566  010146                      MOV     R1,-(SP)        ;;PUSH R1 ON STACK
  (3)   012570  010246                      MOV     R2,-(SP)        ;;PUSH R2 ON STACK
  (3)   012572  010346                      MOV     R3,-(SP)        ;;PUSH R3 ON STACK
  (3)   012574  010546                      MOV     R5,-(SP)        ;;PUSH R5 ON STACK
  (1)   012576  012746  020200              MOV     #20200,-(SP)    ;;SET BLANK SWITCH AND SIGN
  (1)   012602  016605  000020              MOV     20(SP),R5       ;;GET THE INPUT NUMBER
  (1)   012606  100004                      BPL     1$              ;;BR IF INPUT IS POS.
  (1)   012610  005405                      NEG     R5              ;;MAKE THE BINARY NUMBER POS.
  (1)   012612  112766  000055  000001      MOVB    #'-,1(SP)       ;;MAKE THE ASCII NUMBER NEG.
  (1)   012620  005000              1$:     CLR     R0              ;;ZERO THE CONSTANTS INDEX
  (1)   012622  012703  013000              MOV     #$DBLK,R3       ;;SETUP THE OUTPUT POINTER
  (1)   012626  112723  000040              MOVB    #' ,(R3)+       ;;SET THE FIRST CHARACTER TO A BLANK
  (1)   012632  005002              2$:     CLR     R2              ;;CLEAR THE BCD NUMBER
  (1)   012634  016001  012770              MOV     $DTBL(R0),R1    ;;GET THE CONSTANT
  (1)   012640  160105              3$:     SUB     R1,R5           ;;FORM THIS BCD DIGIT
  (1)   012642  002402                      BLT     4$              ;;BR IF DONE
  (1)   012644  005202                      INC     R2              ;;INCREASE THE BCD DIGIT BY 1
  (1)   012646  000774                      BR      3$
  (1)   012650  060105              4$:     ADD     R1,R5           ;;ADD BACK THE CONSTANT
  (1)   012652  005702                      TST     R2              ;;CHECK IF BCD DIGIT=0
  (1)   012654  001002                      BNE     5$              ;;FALL THROUGH IF 0
  (1)   012656  105716                      TSTB    (SP)            ;;STILL DOING LEADING 0'S?
  (1)   012660  100407                      BMI     7$              ;;BR IF YES
```

```
(1)  012662  106316                  5$:     ASLB    (SP)            ;;MSD?
(1)  012664  103003                          BCC     6$              ;;BR IF NO
(1)  012666  116663  000001  177777          MOVB    1(SP),-1(R3)    ;;YES--SET THE SIGN
(1)  012674  052702  000060          6$:     BIS     #'0,R2          ;;MAKE THE BCD DIGIT ASCII
(1)  012700  052702  000040          7$:     BIS     #' ,R2          ;;MAKE IT A SPACE IF NOT ALREADY A DIGIT
(1)  012704  110223                          MOVB    R2,(R3)+        ;;PUT THIS CHARACTER IN THE OUTPUT BUFFER
(1)  012706  005720                          TST     (R0)+           ;JUST INCREMENTING
(1)  012710  020027  000010                  CMP     R0,#10          ;;CHECK THE TABLE INDEX
(1)  012714  002746                          BLT     2$              ;;GO DO THE NEXT DIGIT
(1)  012716  003002                          BGT     8$              ;;GO TO EXIT
(1)  012720  010502                          MOV     R5,R2           ;;GET THE LSD
(1)  012722  000764                          BR      6$              ;;GO CHANGE TO ASCII
(1)  012724  105726                  8$:     TSTB    (SP)+           ;;WAS THE LSD THE FIRST NON-ZERO?
(1)  012726  100003                          BPL     9$              ;;BR IF NO
(1)  012730  116663  177777  177776          MOVB    -1(SP),-2(R3)   ;;YES--SET THE SIGN FOR TYPING
(1)  012736  105013                  9$:     CLRB    (R3)            ;;SET THE TERMINATOR
(3)  012740  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
(3)  012742  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
(3)  012744  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
(3)  012746  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
(3)  012750  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
(1)  012752  104401  013000                  TYPE    $DBLK           ;;NOW TYPE THE NUMBER
(1)  012756  016666  000002  000004          MOV     2(SP),4(SP)     ;;ADJUST THE STACK
(1)  012764  012616                          MOV     (SP)+,(SP)
(1)  012766  000002                          RTI                     ;;RETURN TO USER
(1)  012770  023420                  $DTBL:  10000.
(1)  012772  001750                          1000.
(1)  012774  000144                          100.
(1)  012776  000012                          10.
(1)  013000  000004                  $DBLK:  .BLKW   4
2293
2294                                 ;SUBROUTINE TO FILL THE SCREEN WITH AN CHARACTER
2295
2296  013010  012701  000105                FILLWC: MOV     #'E,R1          ;LOAD CHARACTER BYTE
2297  013014  004737  010134                        JSR     PC,FILBUF       ;LOAD THE LINE WITH CHAR
2298  013020  013737  001266  013050              MOV     VHO,10$         ;LOAD COUNT
2299  013026  012737  000001  010654  1$:     MOV     #1,XOFFOK       ;INSURE XOFF/XON CONTROL.
2300  013034  004737  010236                      JSR     PC,XPRNT        ;DISPLAY THE LINE
2301  013040  005337  013050                      DEC     10$
2302  013044  001370                            BNE     1$              ;LOOP UNTIL DONE
2303  013046  000207                            RTS     PC              ;EXIT
2304  013050  000000                  10$:    0
2305
2306                                 ;SUBROUTINE TO GET A CHARACTER FROM THE VT50
2307
2308  013052  013737  001254  013124  GETCHR: MOV     TIME0,TIME1     ;LOAD TIME COUNTER
2309  013060  005037  013126                  CLR     TIME2
2310
2311  013064  105777  166206          1$:     TSTB    @VTIS           ;TEST INPUT STATUS
2312  013070  100005                          BPL     2$              ;BR IF CLEARED
2313  013072  017700  166202                  MOV     @VTIB,R0        ;READ A CHAR
2314  013076  062716  000002                  ADD     #2,(SP)         ;UPDATE RETURN
2315  013102  000207                          RTS     PC              ;EXIT
2316
2317  013104  005337  013126          2$:     DEC     TIME2           ;DELAY
2318  013110  001365                          BNE     1$
```

```
MAINDEC-11-DZVTC-E     MACY11 30(1046)  31-AUG-77  09:17  PAGE 15-15
DZVTCE P11     :5-JUN-77 10:41  CONVERT BINARY TO DECIMAL AND TYPE ROUTINE                    SEQ 0053

  2319  013112  005337  013124                DEC     TIME1           ;FINISHED ?
  2320  013116  100362                        BPL     1$              ;LOOP TILL TIME EXPIRED
  2321  013120  104002                        ERROR   2               ;NO INPUT FLAG FROM DEVICE
  2322  013122  000207                        RTS     PC              ;EXIT
  2323
  2324  013124  000000          TIME1:  0
  2325  013126  000000          TIME2:  0
  2326
  2327                          ;MOVE TO THE OUTPUT BUFFER
  2328
  2329  013130  012500          MTOB:   MOV     (R5)+,R0
  2330  013132  012701  025256          MOV     #BUFFER,R1      ;LOAD R1
  2331  013136  112021          1$:     MOVB    (R0)+,(R1)+     ;LOAD BYTE
  2332  013140  100376                  BPL     1$              ;BR UNTIL DONE
  2333  013142  000205                  RTS     R5              ;EXIT
  2334
```

```
                                        ;ASCII MESSAGES
013144  006415  046412  044501  TITLE:  .ASCIZ  <15><15><12>\MAINDEC-11-DZVTC-E VT50A, B, VT50H AND VT52 ACCEPTANCE TEST
013245  000200  043040  M91:    .ASCIZ  <15><12>/  FULL SCREEN OF THE CHARACTER E/<15><12><377>
013311  000200  042040  M92:    .ASCIZ  <15><12>/  DATA PATH TEST /<15><12><377>
013344  000240  044523  M93:    .ASCIZ  <15><12>/  SINGLE CHARACTER PER LINE /<15><12><377>
013401  000240  047523  M94:    .ASCIZ  <15><12>/  ROTATING PATTERN /<15><12><377>
013456  000200  041440  M96:    .ASCIZ  <15><12>/  CURSOR MOTION TEST /<15><12><377>
013517  000240  040524  M97:    .ASCIZ  <15><12>/  TAB, BACKSPACE AND BELL TEST  /<15><12><377>
013605  000240  051105  M910:   .ASCIZ  <15><12>/  ERASE LINE TEST  /<15><12><377>
013667  000200  042440  M911:   .ASCIZ  <15><12>/  ERASE SCREEN TEST  /<15><12><377>
013742  000240  044524  M912:   .ASCIZ  <15><12>/  VIDEO COUPLING TEST /<15><12><377>
014033  045033  005015  M914:   .ASCIZ  <33><110><33><112><15><12>/  TERMINAL IDENTIFIER TEST /<15><12><377>
014076  000200  041440  M920:   .ASCIZ  <15><12>/  COPIER PERIMETER/<15><12><377>
014133  000200  042040  M921:   .ASCIZ  <15><12>/  DISCLAIMER STATEMENT/<15><12><377>
014007  000200  044040  M922:   .ASCIZ  <15><12>/  HOLD SCREEN MODE TEST/<15><12><377>
014044  000240  051107  M923:   .ASCIZ  <15><12>/  GRAPHICS MODE AND REV. LINE FEED TEST/<15><12><377>
014121  015537  055510  M923A:  .ASCIZ  <33><137><33><110><33><112>/  AUTO COPY MODE TEST/<15><12><377>
014160  046033  051120  MPTCNT:  .ASCIZ  <33><110><33><112>/PRINTER CONTROLLER MODE ENTERED/<15><12><377>
014227  033015  055510  050112  MPTSCN:  .ASCIZ  <33><110><33><112>/PRINT A SCREEN OF E'S/<15><12><377>
014264  015510  020112  040440  M923A:  .ASCIZ  <110><33><112>/  AUTO PRINT MODE TEST/<15><12><377>
014321  000200  042513  MKB:    .ASCIZ  <15><12>/ KEYBOARD CHARACTER TEST/<15><12>
014355  120746  105240  505MKB1:  .ASCIZ  /RELEASE THE "SHIFT" KEY/<15><12><377>
014410  005015  042514  052106  MKBA:   .ASCIZ  <15><12>/LEFT TO RIGHT IN A ROW, DEPRESS ONE KEY AT A TIME/<15><12><377>
014477  015000  051412  040524  MKBB:   .ASCIZ  <15><12>/STARTING WITH THE TOP ROW EXCEPT THE THIRD/
014553  040000  051106  046517          .ASCIZ  / FROM RIGHT END AND LAST KEYS/<15><12><377>
014614  005015  052123  051101  MKBB2:  .ASCIZ  <15><12>/STARTING WITH THE TOP ROW EXCEPT THE LAST KEY/<15><12><377>
014677  000150  051412  040524  MKBC:   .ASCIZ  <15><12>/START WITH THE SECOND ROW/<15><12><377>
014736  005015  052123  051101  MKBD:   .ASCIZ  <15><12>/START WITH THE THIRD ROW EXCEPT THE CTRL/
015010  005015  040440  042116          .ASCIZ  <15><12>/ AND THE "BLANK" KEYS/<15><12><377>
015043  000150  051412  040524  MKBD2:  .ASCIZ  <15><12>/START WITH THE THIRD ROW, BEGIN ROW WITH "A" KEY/<15><12><377>
015131  000150  051412  040524  MKBE:   .ASCIZ  <15><12>/START WITH THE FOURTH ROW EXCEPT THE SCROLL/
015206  005015  051454  044510          .ASCIZ  <15><12>/ SHIFT, REPEAT AND AUTO-PRINT/<15><12><377>
015251  000150  051412  040524  MKBF:   .ASCIZ  <15><12>/START WITH THE FIFTH ROW/<15><12><377>
015307  000150  047012  053517  MKBG:   .ASCIZ  <15><12>/NOW HOLD DOWN THE "LEFT-SHIFT" KEY/<15><12><377>
015356  005015  047516  020127  MKBGA:  .ASCIZ  <15><12>/NOW HOLD DOWN THE "RIGHT-SHIFT" KEY/<15><12><377>
015426  005015  047516  020127  MKBH:   .ASCIZ  <15><12>/NOW HOLD DOWN THE "CTRL" KEY/<15><12><377>
015467  000150  051412  040524  MKBI:   .ASCIZ  <15><12>/START WITH THE TOP ROW/<15><12><377>
015522  005015  052123  051101  MKBJ:   .ASCIZ  <15><12>/START WITH THE 2ND ROW/<15><12><377>
015555  000150  051412  040524  MKBK:   .ASCIZ  <15><12>/START  WITH THE 3RD ROW/<15><12><377>
015611  000150  051412  040524  MKBL:   .ASCIZ  <15><12>/START WITH THE 4TH ROW/<15><12><377>
015644  005015  052123  051101  MKBM:   .ASCIZ  <15><12>/START WITH THE LAST ROW/<15><12><377>
015700  005015  053012  032524  MKBN:   .ASCIZ  <15><12><12>/VT50H KEYPAD TEST/<15><12><377>
015727  000150  053012  032524  MKB52:  .ASCIZ  <15><12>/VT52 ALTERNATE KEYPAD MODE TEST/<15><12><377>
015773  000150  041412  040510  MKBQ:   .ASCIZ  <15><12>/CHARACTER WAS IN ERROR/<15><12>
016025  000107  047517  020104          .ASCIZ  /GOOD = /
016034  000040  000040  000075  MKBQ1:  .BYTE   40,40,75,40
016040  000040  000040  000040  MKBQA:  .BYTE   40,40,40,40,40
016045  000102  042101  036440          .ASCII  /BAD = /
016053  000040  000040  000075  MKBQ2:  .BYTE   40,40,75,40
016057  000040  000040  000040  MKBQB:  .BYTE   40,40,40,40,15,12,377,0
016066  005015  042513  041131  MKBR:   .ASCIZ  <15><12>/KEYBOARD CHARACTER TEST COMPLETE/<15><12><377>
016134  005015  047111  040526  INVLID: .ASCIZ  <15><12>/INVALID BUSS ADDRESS-PLEASE RETRY <15><12>

016202  005015  045440  054505  MYE:    .ASCII  <15><12>/ KEYBOARD ASCII AND OCTAL LOOP  15  12
```

```
                                .BYTE   15,12
                                .ASCII  /WHEN A KEY IS DEPRESSED, THE ASCII CHARACTER AND/
                                .BYTE   15,12
                                .ASCIZ  / THE THREE DIGIT OCTAL CODE WILL BE ECHOED/
                                .BYTE   15,12,377,0
016407  015     041412  040510  MKEA:   .ASCII  <15><12>/CHAR = /
016420  040     040     040     MKEA1:  .BYTE   40,40,40,75,40
016425  040     040     040     MKEB:   .BYTE   40,40,40,15,12,377,0
016431  005015  042513  041131  MKEH:   .ASCIZ  <15><12>/KEYBOARD ECHO LOOP/<15><12>
016463  015     012     012     CRLFB:  .BYTE   15,12,12,12,12,12,12,12,12,12
016474  012     012     012     CRLFA:  .BYTE   12,12,12,12,12,377,0
                                ;HOME AND ERASE SCREEN OPCODE
016503  033     110     033     HOMERS: .BYTE   33,110,33,112,377,0
016511  015     052012  040040  PATH:   .ASCII  <15><12>/T aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa/
016563  100     040100  040100          .ASCII  /aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa T/
016633  015     052012  042440          .ASCII  <15><12>/T EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE/
016705  105     042505  042505          .ASCII  /EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE T/
016755  377     000     000             .BYTE   377,0,0
016760  005015  042524  052123  VT50A:  .ASCII  <15><12>/TESTING VT50A (12 LINES-NO COPIER)/
017024  015     012     012             .BYTE   15,12,12,377,0,0
017032  005015  042524  052123  VT50B:  .ASCII  <15><12>/TESTING VT50B (12 LINES-COPIER)/
017073  015     012     012             .BYTE   15,12,12,377,0,0
017101  015     052012  051505  VT55:   .ASCII  <15><12>/TESTING VT55 (24 LINES-COPIER, VT50 BASED)/
017155  015     012     012             .BYTE   15,12,12,377,0,0
017163  015     052012  051505  VT50H:  .ASCII  <15><12>/TESTING VT50H (12 LINES-COPIER-D.C.A.)/
017233  015     012     012             .BYTE   15,12,12,377,0,0
017241  015     052012  051505  VT52K:  .ASCII  <15><12>/TESTING VT52 (24 LINES-NO COPIER OR PRINTER
017316  015     012     012             .BYTE   15,12,12,377,0,0
017324  005015  042524  052123  VT52L:  .ASCII  <15><12>/TESTING VT52 (24 LINES,COPIER-NO PRINTER,
017377  015     012     012             .BYTE   15,12,12,377,0,0
017405  015     052012  051505  VT52M:  .ASCII  <15><12>/TESTING VT52 (24 LINES,PRINTER-NO COPIER)
017460  015     012     012             .BYTE   15,12,12,377,0,0
017466  005015  042524  052123  VT55E:  .ASCII  <15><12>/TESTING VT55 (24 LINES, COPIER, VT52 BASED)/
017543  015     012     012             .BYTE   15,12,12,377,0,0
017551  033     132     377     RFI:    .BYTE   33,132,377,0,0
017556  056033  057433  005015  MQ0:    .ASCIZ  <33><134><33><137><15><12><12>/LOOP ON TEST PATTERN LETTER (A THRU Z, ^
017643  033     015534  006537  MQ1:    .ASCIZ  <33><134><33><137><15><12><12>/START AT TEST PATTERN LETTER (A THRU Z) ^
017731  015     005012  051124  MQ2:    .ASCIZ  <15><12><12>/TRY AGAIN /<15><12><377>
017752  033     135     012     GOPRNT: .BYTE   33,135,12,12,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0377,0,0
020000  055433  005015  042524  GOHOSC: .ASCIZ  <33><133><15><12>/TESTING SILO REG/<377>
020026  056033  005015  044523  GOOSHS: .ASCIZ  <33><134><15><12>/SILO TEST DONE/<15><12><377>
020054  033     136     377     GOAPMD: .BYTE   33,136,377,0,0
020061  033     137     015     GONAPM: .BYTE   33,137,15,12,12,12,0,0,0,0,0,0,0,0,0,0,0,0,0,0,377,0,0,0,0
020110  044033  045033  020040  M90:    .ASCIZ  <33><110><33><112>/   DIRECT CURSOR ADDRESSING TES^/377,
020156  005015  043012  051111  WHATO:  .ASCIZ  <15><12><12>/FIRST LINE DEVICE ADDRESS ? = /<200>
020221  015     005012  040514  WHAT1:  .ASCIZ  <15><12><12>/LAST LINE DEVICE ADDRESS (CR IF NONE) ? =  <200
020300  005015  020040  020040  PASHED: .ASCIZ  <15><12>/                PASS #     # OF ERRORS
020345  105     051122  051117  EM1:    .ASCIZ  /ERROR FLAG SET ON TRANSMITTER STATUS/
020412  047516  044440  050116  EM2:    .ASCIZ  /NO INPUT FLAG DETECTED/
020441  111     041516  051117  EM3:    .ASCIZ  /INCORRECT I.D. CODE/
020465  125     042516  050130  EM4:    .ASCIZ  /UNEXPECTED OR INCORRECT INPUT CHAR/
020530  047111  040526  044514  EM5:    .ASCIZ  /INVALID BUSS ADDRESS, TRY AGAIN
020570  051105  050122  020103  DH1:    .ASCIZ  /ERRPC   VTNOW   TSTNUM/
020617  105     051122  041520  DH3:    .ASCIZ  /ERRPC   VTNOW   1ST WD  2ND WD  3RD WD
020666  051105  050122  020103  DH4:    .ASCIZ  /ERRPC   VTNOW   TSTNUM   EXPCT   REC'
                                .EVEN
```

```
                                DT1:    $ERRPC,VTNOW,TSTNUM,0
                                DT3:    $ERRPC,VTNOW,SAVE4,SAVE2,SAVE3,0
                                DT4:    $ERRPC,VTNOW,TSTNUM,$GODAT,$BODAT,0

                                        .SBTTL  KEYBOARD CHARACTER CODE TABLES

                                ;THE ACTUAL KEYBOARD LAYOUT IS REQUIRED

020774  021030  021064  021122  VS0RW:  ROW1,ROW2,ROW3,ROW4,ROW1S,ROW1S,ROW1C
021012  021200  021236  021274  VS2RW:  ROW12,ROW22,ROW32,ROW42,ROW12S,ROW12S,ROW12C

021030  000033  000061  000062  ROW1:   .WORD   33,61,62,63,64,65,66,67,70,71,60,55,75,100010
021064  000011  000121  000127  ROW2:   .WORD   11,121,127,105,122,124,131,125,111,117,120,133,134,12,100177
021122  000101  000123  000104  ROW3:   .WORD   101,123,104,106,107,110,112,113,114,73,47,100015
021152  000132  000130  000103  ROW4:   .WORD   132,130,103,126,102,116,115,54,56,100057
021176  100040                  ROWS:   .WORD   100040
                                ;VT52 KEYBOARD EQUIVALENCES(LOWER CASE CHAR.)

021200  000033  000061  000062  ROW12:  .WORD   33,61,62,63,64,65,66,67,70,71,60,55,75,140,100010
021236  000011  000161  000167  ROW22:  .WORD   11,161,167,145,162,164,171,165,151,157,160,133,134,12,100177
021274  000141  000163  000144  ROW32:  .WORD   141,163,144,146,147,150,152,153,154,73,47,173,100015
021326  000172  000170  000143  ROW42:  .WORD   172,170,143,166,142,156,155,54,56,100057

                                ;SHIFTED ROW CODES

021352  000033  000041  000100  ROW1S:  .WORD   33,41,100,43,44,45,136,46,52,50,51,137,53,100010
021406  000033  000041  000100  ROW12S: .WORD   33,41,100,43,44,45,136,46,52,50,51,137,53,176,100010

                                ;CONTROL ROW CODES

021444  000033  000021  000022  ROW1C:  .WORD   33,21,22,23,24,25,26,27,30,31,20,15,35,100010
021500  000033  000021  000022  ROW12C: .WORD   33,21,22,23,24,25,26,27,30,31,20,15,35,0,100010
                                ;VT52   ESCAPE SEQUENCES

021536      033     111     015 REVLF:  .BYTE   33,111,015,377,0         ;REVERSE LINE FEED.

021543      033     075     377 ENAKP:  .BYTE   33,075,377,0,0          ;ENABLE ALTERNATE KEYPAD MODE.
021550      033     076     377 EXAKP:  .BYTE   33,076,377,0,0          ;EXIT ALTERNATE KEYPAD MODE

021555      033     106     000 ENGRAF: .BYTE   33,106,0,377,0          ;ENTER GRAPHICS MODE.
021562      033     107     000 EXGRAF: .BYTE   33,107,0,377,0          ;EXIT GRAPHICS MODE.

021567      033     127     377 ENPNTM: .BYTE   33,127,377,0,0          ;ENABLE PRINTER CONTROLLER MODE.
021574      033     130     377 EXPNTM: .BYTE   33,130,377,0,0          ;DISABLE PRINTER CONTROLLER MODE.

                                ;VT50H KEYPAD CODES
021602      033     120     377 KPTAB:  .BYTE   33,120,-1,33,121,-1,33,122,-1,33,101,-1
021616      067     377     070         .BYTE   67,-1,70,-1,71,-1,33,102,-1
021627      064     377     065         .BYTE   64,-1,65,-1,66,-1,33,103,-1
021640      061     377     062         .BYTE   61,-1,62,-1,63,-1,33,104,-1
021651      060     377     056         .BYTE   60,-1,56,-1,15,-1,0
021660      033     120     377 AKPTAB: .BYTE   33,120,-1,33,121,-1,33,122,-1,33,101,-1
021674      033     077     167         .BYTE   33,77,167,-1,33,77,170,-1,33,77,171,-1,33,102,-1
021713      033     077     164         .BYTE   33,77,164,-1,33,77,165,-1,33,77,166,-1,33,103,-1
```

```
                                .BYTE   33,77,161,-1,33,77,162,-1,33,77,163,-1,33,104,-1
                                .BYTE   33,77,160,-1,33,77,156,-1,33,77,115,-1,0
023160 016666 000004 000002 SMBE:   .ASCII  <15><12>/GOOD= /<377>
023166 105777 155752        OUT:    .ASCII  /       /<377>
023172 100375               AWAS:   .ASCII  <15><12>/BAD=  /<377>
023174 117766 155746 000004 ERCHR:  .ASCII  <15><12>/KEY CODE ERROR/<377>
023202 042766 177600 000004 INSTR:  .ASCII  /START 1ST ROW LEFT TO RIGHT/<15><12>
023210 026627 000004 000023         .ASCII  /PROCEED TO LAST ROW/<15><12><377>
023216 001013
023220 105777 155720        MTEXTO: .ASCIZ  <15><12><12>/THIS SOFTWARE IS FURNISHED TO PURCHASER UNDER A LICENSE FOR
023224 100375               MTEXT1: .ASCIZ  <15><12>/ON A SINGLE COMPUTER SYSTEM AND CAN BE COPIED (WITH INCLUSION/
023226 117746 155714        MTEXT2: .ASCIZ  <15><12>/OF DEC'S COPYRIGHT NOTICE) ONLY FOR USE IN SUCH SYSTEM, EXCEPT/
023232 042716 177600        MTEXT3: .ASCIZ  <15><12>/AS MAY OTHERWISE BE PROVIDED IN WRITING BY DEC./<377>
023236 022627 000021
023242 001366               MTEXT4: .ASCIZ  <15><12><12>/THE INFORMATION IN THIS DOCUMENT IS SUBJECT TO CHANGE WITHO
023244 000750               MTEXT5: .ASCIZ  <15><12>/NOTICE AND SHOULD NOT BE CONSTRUED AS A COMMITMENT BY DIGITAL/
023246 026627 000004 000140 MTEXT6: .ASCIZ  <15><12>/EQUIPMENT CORPORATION./<377>
023254 002407               MTEXT7: .ASCIZ  <15><12><12>/DEC ASSUMES NO RESPONSIBILITY FOR THE USE OR RELIABILITY OF
023256 026627 000004 000175 MTEXT8: .ASCII  <15><12>/ITS SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC./
023264 003003                       .BYTE   15,12,377,0
023266 042766 000040 000004 .SBTTL  TTY INPUT ROUTINE

                            ;;**********************************************************************
                            .ENABL  LSB

                            .DSABL  LSB


                            ;;**********************************************************************
                            ;;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
                            ;;*CALL:
                            ;;*      RDCHR                   ;;INPUT A SINGLE CHARACTER FROM THE TTY
                            ;;*      RETURN HERE             ;;CHARACTER IS ON THE STACK
                            ;;*                              ;;WITH PARITY BIT STRIPPED OFF
                            ;;

023156 011646               $RDCHR: MOV     (SP),-(SP)      ;;PUSH DOWN THE PC
023160 016666 000004 000002         MOV     4(SP),2(SP)     ;;SAVE THE PS
023166 105777 155752        1$:     TSTB    @#TKS           ;;WAIT FOR
023172 100375                       BPL     1$              ;;A CHARACTER
023174 117766 155746 000004         MOVB    @#TKB,4(SP)     ;;READ THE TTY
023202 042766 177600 000004         BIC     #^C<177>,4(SP)  ;;GET RID OF JUNK IF ANY
023210 026627 000004 000023         CMP     4(SP),#23       ;;IS IT A CONTROL-S?
023216 001013                       BNE     3$              ;;BRANCH IF NO
023220 105777 155720        2$:     TSTB    @#TKS           ;;WAIT FOR A CHARACTER
023224 100375                       BPL     2$              ;;LOOP UNTIL ITS THERE
023226 117746 155714                MOVB    @#TKB,-(SP)     ;;GET CHARACTER
023232 042716 177600                BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
023236 022627 000021                CMP     (SP)+,#21       ;;IS IT A CONTROL-Q?
023242 001366                       BNE     2$              ;;IF NOT DISCARD IT
023244 000750                       BR      1$              ;;YES, RESUME
023246 026627 000004 000140 3$:     CMP     4(SP),#140      ;;IS IT UPPER CASE?
023254 002407                       BLT     4$              ;;BRANCH IF YES
023256 026627 000004 000175         CMP     4(SP),#175      ;;IS IT A SPECIAL CHAR?
023264 003003                       BGT     4$              ;;BRANCH IF YES
023266 042766 000040 000004         BIC     #40,4(SP        ;;MAKE IT UPPER CASE
```

```
                        4$:     RTI                             ;;GO BACK TO USER
                                ;;**********************************************************
                                ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
                                ;*CALL:
                                ;*      RDLIN                   ;;INPUT A STRING FROM THE TTY
                                ;*      RETURN HERE             ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
                                ;*                              ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
                        $RDLIN: MOV     R3,-(SP)                ;;SAVE R3
023276  010346          1$:     MOV     #$TTYIN,R3              ;;GET ADDRESS
023300  012703  023404   2$:     CMP     #$TTYIN+8.,R3           ;;BUFFER FULL?
023304  022703  023414           BLOS    4$                      ;;BR IF YES
023310  101405                   RDCHR                           ;;GO READ ONE CHARACTER FROM THE TTY
023312  104406                   MOVB    (SP)+,(R3)              ;;GET CHARACTER
023314  112613           10$:    CMPB    #177,(R3)               ;;IS IT A RUBOUT
023316  122713  000177           BNE     3$                      ;;SKIP IF NOT
023322  001003                   TYPE    $QUES                   ;;TYPE A '?'
023324  104401  001166           BR      1$                      ;;CLEAR THE BUFFER AND LOOP
023330  000763           3$:     MOVB    (R3),9$                 ;;ECHO THE CHARACTER
023332  111337  023402           TYPE    9$
023336  104401  023402           CMPB    #15,(R3)+               ;;CHECK FOR RETURN
023342  122723  000015           BNE     2$                      ;;LOOP IF NOT RETURN
023346  001356                   CLRB    -1(R3)                  ;;CLEAR RETURN (THE 15)
023350  105063  177777           TYPE    $LF                     ;;TYPE A LINE FEED
023354  104401  001170           MOV     (SP)+,R3                ;;RESTORE R3
023360  012603                   MOV     (SP),-(SP)              ;;ADJUST THE STACK AND PUT ADDRESS OF THE
023362  011646                   MOV     4(SP),2(SP)             ;;      FIRST ASCII CHARACTER ON IT
023364  016666  000004  000002   MOV     #$TTYIN,4(SP)
023372  012766  023404  000004   RTI                             ;;RETURN
023400  000002           9$:     .BYTE   0                       ;;STORAGE FOR ASCII CHAR. TO TYPE
023402      000                  .BYTE   0                       ;;TERMINATOR
023403      000          $TTYIN: .BLKB   8.                      ;;RESERVE 8 BYTES FOR TTY INPUT
023404  000010           $CNTLU: .ASCIZ  /^U/<15><12>            ;;CONTROL "U"
023414  052536  005015  $CNTLG: .ASCIZ  /^G/<15><12>            ;;CONTROL "G"
023421      136  006507  000012
023426  005015  053523  020122  $MSWR:   .ASCIZ  <15><12>/SWR = /
023434  020075      000
023437      040  047040  053505  $MNEW:   .ASCIZ  /  NEW =
023444  036440  000040

                        .SBTTL  READ AN OCTAL NUMBER FROM THE TTY

                                ;;**********************************************************************
                                ;*THIS ROUTINE WILL READ AN OCTAL (ASCII) NUMBER FROM THE TTY AND
                                ;*CHANGE IT TO BINARY.
                                ;*THE INPUT CHARACTERS WILL BE CHECKED TO INSURED THEY ARE LEGAL
                                ;*OCTAL DIGITS. IF AN ILLEGAL CHARACTER IS READ A "?" WILL BE TYPED
                                ;*FOLLOWED BY A CARRIAGE RETURN-LINE FEED. THE COMPLETE NUMBER MUST
                                ;*THEN BE RETYPED. THE INPUT IS TERMINATED BY TYPING A CARRIAGE RETURN.
                                ;*CALL:
                                ;*      RDOCT                   ;;READ AN OCTAL NUMBER
                                ;*      RETURN HERE             ;;LOW ORDER BITS ARE ON TOP OF THE STACK
                                ;*                              ;;HIGH ORDER BITS ARE IN $HIOCT

                        $RDOCT: MOV     (SP),-(SP)              ;;PROVIDE SPACE FOR THE
023450  011646  016666  000004  MOV     4(SP),2(SP)             ;;INPUT NUMBER
023452  000002  010046          MOV     R0,-(SP)                ;;PUSH R0 ON STACK
023460  010046  010146          MOV     R1,-(SP)                ;;PUSH R1 ON STACK
023462  010146
```

```
                        023464  010246                  MOV     R2,-(SP)        ;;PUSH R2 ON STACK
                        023466  104407          1$:     RDLIN                   ;;READ AN ASCIZ LINE
                        023470  012600                  MOV     (SP)+,R0        ;;GET ADDRESS OF 1ST CHARACTER
                        023472  010037  023576          MOV     R0,5$           ;;AND SAVE IT
                        023476  005001                  CLR     R1              ;;CLEAR DATA WORD
                        023500  005002                  CLR     R2
                        023502  112046          2$:     MOVB    (R0)+,-(SP)     ;;PICKUP THIS CHARACTER
                        023504  001420                  BEQ     3$              ;;IF ZERO GET OUT
                        023506  122716  000060          CMPB    #'0,(SP)        ;;MAKE SURE THIS CHARACTER
                        023512  003026                  BGT     4$              ;;IS AN OCTAL DIGIT
                        023514  122716  000067          CMPB    #'7,(SP)
                        023520  002423                  BLT     4$
                        023522  006301                  ASL     R1              ;;*2
                        023524  006102                  ROL     R2
                        023526  006301                  ASL     R1              ;;*4
                        023530  006102                  ROL     R2
                        023532  006301                  ASL     R1              ;;*8
                        023534  006102                  ROL     R2
                        023536  042716  177770          BIC     #^C7,(SP)       ;;STRIP THE ASCII JUNK
                        023542  062601                  ADD     (SP)+,R1        ;;ADD IN THIS DIGIT
                        023544  000756                  BR      2$              ;;LOOP
                        023546  005726          3$:     TST     (SP)+           ;;CLEAN TERMINATOR FROM STACK
                        023550  010166  000012          MOV     R1,12(SP)       ;;SAVE THE RESULT
                        023554  010237  023606          MOV     R2,$HIOCT
                        023560  012602                  MOV     (SP)+,R2        ;;POP STACK INTO R2
                        023562  012601                  MOV     (SP)+,R1        ;;POP STACK INTO R1
                        023564  012600                  MOV     (SP)+,R0        ;;POP STACK INTO R0
                        023566  000002                  RTI                     ;;RETURN
                        023570  005726          4$:     TST     (SP)+           ;;CLEAN PARTIAL FROM STACK
                        023572  105010                  CLRB    (R0)            ;;SET A TERMINATOR
                        023574  104401                  TYPE                    ;;TYPE UP THRU THE BAD CHAR.
                        023576  000000          5$:     .WORD   0
                        023600  104401  001166          TYPE    ,$QUES          ;;"?" "CR" & "LF"
                        023604  000730                  BR      1$              ;;TRY AGAIN
                        023606  000000          $HIOCT: .WORD   0               ;;HIGH ORDER BITS GO HERE
                        023610  105777  155324  MSCOPE: TSTB    @SWR            ;TEST BIT 7
                        023614  100003                  BPL     $SCOPE          ;NOT SET
                        023616  005737  010650          TST     LOOP            ;TEST LOOP
                        023622  001041                  BNE     $OVER           ;SET LOOP ON TEST

                                                .SBTTL  SCOPE HANDLER ROUTINE

                                                ;;**********************************************************************
                                                ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
                                                ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>
                                                ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
                                                ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
                                                ;*SW14=1         LOOP ON TEST
                                                ;*SW08=1         LOOP ON TEST IN SWR<7:0>
                                                ;*CALL
                                                ;*      SCOPE           ;;SCOPE=IOT

                        023624                  $SCOPE:
                        023624  032777  040000  155306  1$:     BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
                        023632  001035                  BNE     $OVER           ;;YES IF SW14=1
                                                ;*****START OF CODE FOR THE XOR TESTER*****
```

```
                                $XTSTR: BR      6$                      ;;IF RUNNING ON THE "XOR" TESTER CHANGE
                                                                        ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
023636  013746  000004                  MOV     @#ERRVEC,-(SP)          ;;SAVE THE CONTENTS OF THE ERROR VECTOR
023642  012737  023662  000004          MOV     #5$,@#ERRVEC            ;;SET FOR TIMEOUT
023650  005737  177060                  TST     @#177060                ;;TIME OUT ON XOR?
023654  012637  000004                  MOV     (SP)+,@#ERRVEC          ;;RESTORE THE ERROR VECTOR
023660  000414                          BR      $SVLAD                  ;;GO TO THE NEXT TEST
023662  022626                  5$:     CMP     (SP)+,(SP)+             ;;CLEAR THE STACK AFTER A TIME OUT
023664  012637  000004                  MOV     (SP)+,@#ERRVEC          ;;RESTORE THE ERROR VECTOR
023670  000416                          BR      $OVER                   ;;LOOP ON THE PRESENT TEST
023672                          6$:;*****END OF CODE FOR THE XOR TESTER*****
023672  032777  000400  155240          BIT     #BIT08,@SWR             ;;LOOP ON SPEC. TEST?
023700  001404                          BEQ     $SVLAD                  ;;BR IF NO
023702  127737  155232  001102          CMPB    @SWR,$TSTNM             ;;ON THE RIGHT TEST?    SWR 7:0
023710  001406                          BEQ     $OVER                   ;;BR IF YES
023712  105237  001102          $SV_AD: INCB    $TSTNM                  ;;COUNT TEST NUMBERS
023716  011637  001106                  MOV     (SP),$LPADR             ;;SAVE SCOPE LOOP ADDRESS
023722  105037  001103                  CLRB    $ERFLG                  ;;ZERO THE ERROR FLAG
023726  013777  001102  155206  $OVER:  MOV     $TSTNM,@DISPLAY         ;;DISPLAY TEST NUMBER
023734  013716  001106                  MOV     $LPADR,(SP)             ;;FUDGE RETURN ADDRESS
023740  000002                          RTI                             ;;FIXES PS

                                .SBTTL  ERROR HANDLER ROUTINE

                                ;;**********************************************************************
                                ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
                                ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
                                ;*AND GO TO $ERRTYP ON ERROR
                                ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
                                ;*SW15=1         HALT ON ERROR
                                ;*SW13=1         INHIBIT ERROR TYPEOUTS
                                ;*CALL
                                ;*      ERROR   N       ;;ERROR=EMT AND N=ERROR ITEM NUMBER

023742                  $ERROR:
023742  113737  001102  001252          MOVB    $TSTNM,TSTNUM
023750  105237  001103          7$:     INCB    $ERFLG                  ;;SET THE ERROR FLAG
023754  001775                          BEQ     7$                      ;;DON'T LET THE FLAG GO TO ZERO
023756  013777  001102  155156          MOV     $TSTNM,@DISPLAY         ;;DISPLAY TEST NUMBER AND ERROR FLAG
023764  005237  001112                  INC     $ERTTL                  ;;INC THE ERROR COUNT
023770  011637  001116                  MOV     (SP),$ERRPC             ;;GET ADDRESS OF ERROR INSTRUCTION
023774  162737  000002  001116          SUB     #2,$ERRPC
024002  117737  155110  001114          MOVB    @$ERRPC,$ITEMB          ;;STRIP AND SAVE THE ERROR ITEM CODE
024010  032777  020000  155122          BIT     #BIT13,@SWR             ;;SKIP TYPEOUT IF SET
024016  001004                          BNE     20$                     ;;SKIP TYPEOUTS
024020  004737  024054                  JSR     PC,$ERRTYP              ;;GO TO USER ERROR ROUTINE
024024  104401  001167                  TYPE    ,$CRLF
024030                          20$:
024030  005777  155104          2$:     TST     @SWR                    ;;HALT ON ERROR
024034  100001                          BPL     3$                      ;;SKIP IF CONTINUE
024036  000000                          HALT                            ;;HALT ON ERROR!
024040                          3$:
024040  022737  007014  000042          CMP     #$ENDAD,@#42            ;;ACT-11 AUTO-ACCEPT?
024046  001001                          BNE     6$                      ;;BRANCH IF NO
024050  000000                          HALT                            ;;YES
024052                          6$:
```

```
(1)  024052  000002                    RTI                     ;;RETURN

2550
2551                                .SBTTL  ERROR MESSAGE TYPEOUT ROUTINE
(1)
(2)                                 ;;**********************************************************************
(1)                                 ;*THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE WHICH
(1)                                 ;*ERROR IS TO BE REPORTED. IT THEN OBTAINS, FROM THE "ERROR TABLE" ($ERRTB),
(1)                                 ;*AND REPORTS THE APPROPRIATE INFORMATION CONCERNING THE ERROR.
(1)
(1)  024054                         $ERRTYP:
(1)  024054  104401  001167                 TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
(1)  024060  010046                         MOV     R0,-(SP)        ;;SAVE R0
(1)  024062  005000                         CLR     R0              ;;PICKUP THE ITEM INDEX
(1)  024064  153700  001114                 BISB    @#$ITEMB,R0
(1)  024070  001004                         BNE     1$              ;;IF ITEM NUMBER IS ZERO, JUST
(1)                                                                 ;;TYPE THE PC OF THE ERROR
(2)  024072  013746  001116                 MOV     $ERRPC,-(SP)    ;;SAVE $ERRPC FOR TYPEOUT
(2)                                                                 ;;ERROR ADDRESS
(2)  024076  104402                         TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
(1)  024100  000426                         BR      6$              ;;GET OUT
(1)  024102  005300                 1$:     DEC     R0              ;;ADJUST THE INDEX SO THAT IT WILL
(1)  024104  006300                         ASL     R0              ;;       WORK FOR THE ERROR TABLE
(1)  024106  006300                         ASL     R0
(1)  024110  006300                         ASL     R0
(1)  024112  062700  001172                 ADD     #$ERRTB,R0      ;;FORM TABLE POINTER
(1)  024116  012037  024126                 MOV     (R0)+,2$        ;;PICKUP "ERROR MESSAGE" POINTER
(1)  024122  001404                         BEQ     3$              ;;SKIP TYPEOUT IF NO POINTER
(1)  024124  104401                         TYPE                    ;;TYPE THE "ERROR MESSAGE"
(1)  024126  000000                 2$:     .WORD   0               ;;"ERROR MESSAGE" POINTER GOES HERE
(1)  024130  104401  001167                 TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
(1)  024134  012037  024144         3$:     MOV     @(R0)+,4$       ;;PICKUP "DATA HEADER" POINTER
(1)  024140  001404                         BEQ     5$              ;;SKIP TYPEOUT IF 0
(1)  024142  104401                         TYPE                    ;;TYPE THE "DATA HEADER"
(1)  024144  000000                 4$:     .WORD   0               ;;"DATA HEADER" POINTER GOES HERE
(1)  024146  104401  001167                 TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
(1)  024152  011000                 5$:     MOV     @(R0),R0        ;;PICKUP "DATA TABLE" POINTER
(1)  024154  001004                         BNE     7$              ;;GO TYPE THE DATA
(1)  024156  012600                 6$:     MOV     (SP)+,R0        ;;RESTORE R0
(1)  024160  104401  001167                 TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
(1)  024164  000207                         RTS     PC              ;;RETURN
(1)  024166                         7$:
(2)  024166  013046                         MOV     @(R0)+,-(SP)    ;;SAVE @(R0)+ FOR TYPEOUT
(2)  024170  104402                         TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
(1)  024172  005710                         TST     (R0)            ;;IS THERE ANOTHER NUMBER?
(1)  024174  001770                         BEQ     6$              ;;BR IF NO
(1)  024176  104401  024204                 TYPE    ,8$             ;;TYPE TWO(2) SPACES
(1)  024202  000771                         BR      7$              ;;LOOP
(1)  024204  020040      000        8$:     .ASCIZ  /  /            ;;TWO(2) SPACES
(1)          024210                         .EVEN
2552
2553                                .SBTTL  TYPE ROUTINE
(1)
(2)                                 ;;**********************************************************************
(1                                  ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
 1                                  ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
                                    ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
```

```
(1)                                     ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
(1)                                     ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
(1)                                     ;*
(1)                                     ;*CALL:
(1)                                     ;*1) USING A TRAP INSTRUCTION
(1)                                     ;*      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
(1)                                     ;*OR
(1)                                     ;*      TYPE
(1)                                     ;*      MESADR
(1)                                     ;*
(1)
(1)  024210  105737  001157     $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
(1)  024214  100002                     BPL     1$              ;;BR IF YES
(1)  024216  000000                     HALT                    ;;HALT HERE IF NO TERMINAL
(1)  024220  000407                     BR      3$              ;;LEAVE
(1)  024222  010046             1$:     MOV     R0,-(SP)        ;;SAVE R0
(1)  024224  017600  000002             MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
(1)  024230  112046             2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
(1)  024232  001005                     BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
(1)  024234  005726                     TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
(1)  024236  012600             60$:    MOV     (SP)+,R0        ;;RESTORE R0
(1)  024240  062716  000002     3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
(1)  024244  000002                     RTI                     ;;RETURN
(1)  024246  122716  000011     4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
(1)  024252  001430                     BEQ     8$
(1)  024254  122716  000200             CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
(1)  024260  001006                     BNE     5$
(1)  024262  005726                     TST     (SP)+           ;;POP  <CR><LF> EQUIV
(1)  024264  104401                     TYPE                    ;;TYPE A CR AND LF
(1)  024266  001167                     $CRLF
(1)  024270  105037  024424             CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
(1)  024274  000755                     BR      2$              ;;GET NEXT CHARACTER
(1)  024276  004737  024360     5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
(1)  024302  123726  001156     6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
(1)  024306  001350                     BNE     2$              ;;IF NO GO GET NEXT CHAR.
(1)  024310  013746  001154             MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
(1)                                                             ;;AND THE NULL CHAR.
(1)  024314  105366  000001     7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
(1)  024320  002770                     BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
(1)  024322  004737  024360             JSR     PC,$TYPEC       ;;GO TYPE A NULL
(1)  024326  105337  024424             DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
(1)  024332  000770                     BR      7$              ;;LOOP
(1)
(1)                             ;HORIZONTAL TAB PROCESSOR
(1)
(1)  024334  112716  000040     8$:     MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
(1)  024340  004737  024360     9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
(1)  024344  132737  000007  024424     BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
(1)  024352  001372                     BNE     9$              ;;TAB STOP
(1)  024354  005726                     TST     (SP)+           ;;POP SPACE OFF STACK
(1)  024356  000724                     BR      2$              ;;GET NEXT CHARACTER
(1)  024360  105777  154564     $TYPEC: TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
(1)  024364  100375                     BPL     $TYPEC
(1)  024366  116677  000002  154556     MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
(1)  024374  122766  000015  000002     CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
(1)  024402  001003                     BNE     1$              ;;BRANCH IF NO
```

```
(1)  024404  105037  024424              CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
(1)  024410  000406                      BR      $TYPEX          ;;EXIT
(1)  024412  122766  000012  000002  1$: CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
(1)  024420  001402                      BEQ     $TYPEX          ;;BRANCH IF YES
(1)  024422  105227                      INCB    (PC)+           ;;COUNT THE CHARACTER
(1)  024424  000000              $CHARCNT:.WORD  0               ;;CHARACTER COUNT STORAGE
(1)  024426  000207              $TYPEX: RTS     PC
(1)
2554
2555                             .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
(1)
(2)                              ;;**************************************************************
(1)                              ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
(1)                              ;*OCTAL (ASCII) NUMBER AND TYPE IT.
(1)                              ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
(1)                              ;*CALL:
(1)                              ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
(1)                              ;*      TYPOS                   ;;CALL FOR TYPEOUT
(1)                              ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
(1)                              ;*      .BYTE   M               ;;M=1 OR 0
(1)                              ;*                                      ;;1=TYPE LEADING ZEROS
(1)                              ;*                                      ;;0=SUPPRESS LEADING ZEROS
(1)                              ;*
(1)                              ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
(1)                              ;*$TYPOS OR $TYPOC
(1)                              ;*CALL:
(1)                              ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
(1)                              ;*      TYPON                   ;;CALL FOR TYPEOUT
(1)                              ;*
(1)                              ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
(1)                              ;*CALL:
(1)                              ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
(1)                              ;*      TYPOC                   ;;CALL FOR TYPEOUT
(1)
(1)  024430  017646  000000      $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
(1)  024434  116637  000001  024653      MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
(1)  024442  112637  024655              MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
(1)  024446  062716  000002              ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
(1)  024452  000406                      BR      $TYPON
(1)  024454  112737  000001  024653  $TYPOC: MOVB  #1,$OFILL      ;;SET THE ZERO FILL SWITCH
(1)  024462  112737  000006  024655      MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
(1)  024470  112737  000005  024652  $TYPON: MOVB  #5,$OCNT       ;;SET THE ITERATION COUNT
(1)  024476  010346                      MOV     R3,-(SP)        ;;SAVE R3
(1)  024500  010446                      MOV     R4,-(SP)        ;;SAVE R4
(1)  024502  010546                      MOV     R5,-(SP)        ;;SAVE R5
(1)  024504  113704  024655              MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
(1)  024510  005404                      NEG     R4
(1)  024512  062704  000006              ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
(1)  024516  110437  024654              MOVB    R4,$OMODE       ;;SAVE IT FOR USE
(1)  024522  113704  024653              MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
(1)  024526  016605  000012              MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
(1)  024532  005003                      CLR     R3              ;;CLEAR THE OUTPUT WORD
(1)  024534  006105              1$:     ROL     R5              ;;ROTATE MSB INTO "C"
(1)  024536  000404                      BR      3$              ;;GO DO MSB
(1)  024540  006105              2$:     ROL     R5              ;;FORM THIS DIGIT
(1)  024542  006105                      ROL     R5
```

```
(1)  024544  006105                        ROL     R5
(1)  024546  010503                        MOV     R5,R3
(1)  024550  006103                3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
(1)  024552  105337  024654               DECB    $OMODE          ;;TYPE THIS DIGIT?
(1)  024556  100016                        BPL     7$              ;;BR IF NO
(1)  024560  042703  177770               BIC     #177770,R3      ;;GET RID OF JUNK
(1)  024564  001002                        BNE     4$              ;;TEST FOR 0
(1)  024566  005704                        TST     R4              ;;SUPPRESS THIS 0?
(1)  024570  001403                        BEQ     5$              ;;BR IF YES
(1)  024572  005204                4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
(1)  024574  052703  000060               BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
(1)  024600  052703  000040        5$:     BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
(1)  024604  110337  024650               MOVB    R3,8$           ;;SAVE FOR TYPING
(1)  024610  104401  024650               TYPE    ,8$             ;;GO TYPE THIS DIGIT
(1)  024614  105337  024652        7$:     DECB    $OCNT           ;;COUNT BY 1
(1)  024620  003347                        BGT     2$              ;;BR IF MORE TO DO
(1)  024622  002402                        BLT     6$              ;;BR IF DONE
(1)  024624  005204                        INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
(1)  024626  000744                        BR      2$              ;;GO DO THE LAST DIGIT
(1)  024630  012605                6$:     MOV     (SP)+,R5        ;;RESTORE R5
(1)  024632  012604                        MOV     (SP)+,R4        ;;RESTORE R4
(1)  024634  012603                        MOV     (SP)+,R3        ;;RESTORE R3
(1)  024636  016666  000002  000004        MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
(1)  024644  012616                        MOV     (SP)+,(SP)
(1)  024646  000002                        RTI                     ;;RETURN
(1)  024650     000                8$:     .BYTE   0               ;;STORAGE FOR ASCII DIGIT
(1)  024651     000                        .BYTE   0               ;;TERMINATOR FOR TYPE ROUTINE
(1)  024652     000                $OCNT:  .BYTE   0               ;;OCTAL DIGIT COUNTER
(1)  024653     000                $OFILL: .BYTE   0               ;;ZERO FILL SWITCH
(1)  024654  000000                $OMODE: .WORD   0               ;;NUMBER OF DIGITS TO TYPE
2556                                .SBTTL  RANDOM NUMBER GENERATOR ROUTINE
(1)
(2)                                 ;;**************************************************************
(1)                                 ;*THIS ROUTINE IS A DOUBLE PRECISION PSEUDO RANDOM NUMBER GENERATOR
(1)                                 ;*WITH A RANGE OF 0 TO 2(+33)-1.
(1)                                 ;*CALL:
(1)                                 ;*      JSR     PC,$RAND        ;;CALL THE ROUTINE
(1)                                 ;*      RETURN                  ;;RETURN HERE THE RANDOM
(1)                                 ;*                              ;;NUMBER WILL BE IN
(1)                                 ;*                              ;;$HINUM,$LONUM
(1)
(1)  024656                         $RAND:
(3)  024656  010046                        MOV     R0,-(SP)        ;;PUSH R0 ON STACK
(3)  024660  010146                        MOV     R1,-(SP)        ;;PUSH R1 ON STACK
(3)  024662  010246                        MOV     R2,-(SP)        ;;PUSH R2 ON STACK
(1)  024666  013700  024756                MOV     $LONUM,R0       ;;SET R0 WITH LOW
(1)  024670  013701  024754                MOV     $HINUM,R1       ;;SET R1 WITH HIGH
(1)  024674  012702  177771                MOV     #-7,R2          ;;SET SHIFT COUNT
(1)  024700  006300                1$:     ASL     R0              ;;SHIFT R0 LEFT AND
(1)  024702  006101                        ROL     R1              ;;ROTATE CARRY INTO R1 AND
(1)  024704  005202                        INC     R2              ;;CHECK FOR DONE
(1)  024706  001374                        BNE     1$              ;;CONTINUE SHIFT LOOP
(1)  024710  063700  024756                ADD     $LONUM,R0       ;;ADD NUMBER TO MAKE X 129
(1)  024714  005501                        ADC     R1              ;;PROPOGATE CARRY
(1)  024716  063701  024754                ADD     $HINUM,R1       ;;ADD NUMBER TO MAKE X 129
(1)  024722  062700  001057                ADD     #1057,R0        ;;ADD LOW CONSTANT
```

```
(1)  024726  005501                    ADC     R1                      ;;PROPOGATE CARRY
(1)  024730  062701  047401            ADD     #47401,R1               ;;ADD HIGH CONSTANT
(1)  024734  010037  024756            MOV     R0,$LONUM               ;;SAVE R0
(1)  024740  010137  024754            MOV     R1,$HINUM               ;;SAVE R1
(3)  024744  012602                    MOV     (SP)+,R2                ;;POP STACK INTO R2
(3)  024746  012601                    MOV     (SP)+,R1                ;;POP STACK INTO R1
(3)  024750  012600                    MOV     (SP)+,R0                ;;POP STACK INTO R0
(1)  024752  000207                    RTS     PC                      ;;RETURN
(1)  024754  176543            $HINUM: .WORD   176543
(1)  024756  123456            $LONUM: .WORD   123456
2557                           .SBTTL  TRAP DECODER
(1)
(2)                            ;;**************************************************************
(1)                            ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
(1)                            ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
(1)                            ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
(1)                            ;*GO TO THAT ROUTINE.
(1)
(1)  024760  010046            $TRAP:  MOV     R0,-(SP)                ;;SAVE R0
(1)  024762  016600  000002            MOV     2(SP),R0                ;;GET TRAP ADDRESS
(1)  024766  005740                    TST     -(R0)                   ;;BACKUP BY 2
(1)  024770  111000                    MOVB    (R0),R0                 ;;GET RIGHT BYTE OF TRAP
(1)  024772  006300                    ASL     R0                      ;;POSITION FOR INDEXING
(1)  024774  016000  025014            MOV     $TRPAD(R0),R0           ;;INDEX TO TABLE
(1)  025000  000200                    RTS     R0                      ;;GO TO ROUTINE
(1)
(1)
(1)                            ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO
(1)
(1)  025002  011646            $TRAP2: MOV     (SP),-(SP)              ;;MOVE THE PC DOWN
(1)  025004  016666  000004  000002    MOV     4(SP),2(SP)             ;;MOVE THE PSW DOWN
(1)  025012  000002                    RTI                             ;;RESTORE THE PSW
(1)
(3)                            .SBTTL  TRAP TABLE
(3)
(3)                            ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
(3)                            ;*BY THE "TRAP" INSTRUCTION.
(3)
(3)                            ;       ROUTINE
(3)                            ;       -------
(3)  025014  025002            $TRPAD: .WORD   $TRAP2
(3)  025016  024210                    $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
(3)  025020  024454                    $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
(3)  025022  024430                    $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
(3)  025024  024470                    $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
(3)  025026  012564                    $TYPDS  ;;CALL=TYPDS    TRAP+5(104405)  TYPE DECIMAL NUMBER (WITH SIGN)
(1)
(1)
(3)  025030  023156                    $RDCHR  ;;CALL=RDCHR    TRAP+6(104406)  TTY TYPEIN CHARACTER ROUTINE
(3)  025032  023276                    $RDLIN  ;;CALL=RDLIN    TRAP+7(104407)  TTY TYPEIN STRING ROUTINE
(3)  025034  023450                    $RDOCT  ;;CALL=RDOCT    TRAP+10(104410) READ AN OCTAL NUMBER FROM TTY
2558                           .SBTTL  POWER DOWN AND UP ROUTINES
(1)
(2)                            ;;**************************************************************
(1)                            ;POWER DOWN ROUTINE
(1)  025036  012737  025176  000024  $PWRDN: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST UP
```

```
                                    ;PRIO:7
                                    ;PUSH R0 ON STACK
                                    ;PUSH R1 ON STACK
                                    ;PUSH R2 ON STACK
                                    ;PUSH R3 ON STACK
                                    ;PUSH R4 ON STACK
                                    ;PUSH R5 ON STACK
                                    ;PUSH @SWR ON STACK
                                    ;SAVE SP
                                    ;;SET UP VECTOR
                                    ;;HANG UP

                                    ;;*****************************************************************
                                    ;POWER UP ROUTINE
                                    ;;SET FOR FAST DOWN
                                    ;;GET SP
                                    ;;WAIT LOOP FOR THE TTY
                                    ;;WAIT FOR THE INC
                                    ;;OF WORD
                                    ;;POP STACK INTO @SWR
                                    ;;POP STACK INTO R5
                                    ;;POP STACK INTO R4
                                    ;;POP STACK INTO R3
                                    ;;POP STACK INTO R2
                                    ;;POP STACK INTO R1
                                    ;;POP STACK INTO R0
                                    ;;SET UP THE POWER DOWN VECTOR
                                    ;PRIO:7
                                    ;REPORT THE POWER FAILURE
                                    ;;POWER FAIL MESSAGE POINTER
                                    ;;THE POWER UP SEQUENCE WAS STARTED
                                    ;;  BEFORE THE POWER DOWN WAS COMPLETE
                                    ;;PUT THE SP HERE
                                    .EVEN
2562  025214  000010                HOLD:   .BLKW   10
2563  025234  000010                GOOD:   .BLKW   10
2564  025254  000000                RETRY:  .WORD   0
2565  025256  000000                BUFFER: 0
2566          000001                        .END
```

```
A       007432          DH3     020617          GRPHST  005266          MKB02   016053          PARITY  011772
ADELAY  011370          DH4     020666          HOLD    025214          MKBR    016066          PASMED  020300
AXPTAB  021660          DIGO    011552          HOMERS  016503          MKBU    014352          PATH    016511
AXSG    011442          DIGI    011554          HT      =000011         MKBS2   015727          PIRQ    =177772
AXSSC   010664          DIG2    011556          IGNORE  010666          MKC     016202          PIRQVE  =000240
AXSS    022014          DISPCH  006616          INSTR   022046          MKEA    016407          PNTWID  001316
AXOFF   010656          DISPLA  001142          INVLID  016134          MKEAI   016420          PRNTST  006342
B       007774          DISPRE  000174          IOTVEC  =000020          MKEB    016425          PRTCNT  001274
BEGIN   001334          DSPCH   010776          KPTAB   021602          MKEH    016434          PR0     =000000
BEGIN1  001410          DSR     =177570         KRBDON  010064          MOVDN1  003110          PR1     =000040
BEGIN2  001420          DTPSR   011154          KRBECH  010100          MOVDWN  003104          PR2     =000100
BEGIN3  001400          DTPSRA  011202          KRBECO  007110          MOVRIG  003126          PR3     =000140
BFCHAG  007336          DTPSRB  011160          KRBTST  007404          MPTCNT  014160          PR4     =000200
BFCHAR  007276          DT1     020734          LAST    001244          MPTSCN  014237          PR5     =000240
BIT0    =000001         DT3     020744          LASTCH  001310          M00     017556          PR6     =000300
BIT00   =000001         DT4     020760          LASTLN  001262          M01     017643          PR7     =000340
BIT01   =000002         E       007646          LBMT    002774          M02     017731          PS      =177776
BIT02   =000004         EMTVEC  =000030         LBMT1   003144          MSCOPE  023610          PSW     =177776
BIT03   =000010         EN1     020345          LCM     003154          MSGTNO  005076          PTCT    001250
BIT04   =000020         EN2     020412          LF      =000012         MSGTXT  004756          PWRVEC  =000024
BIT05   =000040         EN3     020441          LIC     010170          MSGTYP  002436          RBEGIN  001364
BIT06   =000100         EN4     020465          LICA    010206          MTEXT0  022131          ROCHR   =104406
BIT07   =000200         EN5     020530          LICB    010224          MTEXT1  022235          ROLIN   =104407
BIT08   =000400         ENAKP   021543          LOOERL  004016          MTEXT2  022336          ROOCT   =104410
BIT09   =001000         ENGRAF  021555          LOOERS  004174          MTEXT3  022440          RESVEC  =000010
BIT1    =000002         ENPNTM  021567          LOOP    010650          MTEXT4  022523          RETRY   025254
BIT10   =002000         ERCHR   022025          LRL     003436          MTEXT5  022625          REVLF   021536
BIT11   =004000         ERRVEC  =000004         LTAB    003706          MTEXT6  022726          RFI     017551
BIT12   =010000         EXAKP   021550          MANFU   001360          MTEXT7  023760          ROW1    021030
BIT13   =020000         EXGRAF  021562          MASK1   011766          MTEXT8  023060          ROW1C   021444
BIT14   =040000         EXPNTM  021574          MASK2   011770          MT08    013130          ROW1S   021352
BIT15   =100000         F       007716          MKB     014321          M91     013245          ROW12   021200
BIT2    =000004         FILBFA  010154          MKBA    014410          M910    013536          ROW12C  021500
BIT3    =000010         FILBFB  010140          MKBB    014477          M911    013567          ROW12S  021406
BIT4    =000020         FILBUF  010134          MKBB2   014614          M912    013622          ROW2    021064
BIT5    =000040         FILLWC  013010          MKBC    014677          M914    013656          ROW22   021236
BIT6    =000100         FINDOT  010676          MKBD    014736          M92     013313          ROW3    021122
BIT7    =000200         FINDTA  010706          MKBD2   015043          M920    013723          ROW32   021274
BIT8    =000400         FIRLST  011060          MKBE    015131          M921    013753          ROW4    021152
BIT9    =001000         FIRST   001242          MKBF    015251          M922    014007          ROW42   021326
BPTVEC  =000014         FNDA    010670          MKBG    015307          M9221   014044          ROW5    021176
BUFFER  025256          GBBUF   011220          MKBGA   015356          M923    014121          RSTRT   002014
C       007510          GENER   004546          MKBH    015426          M923A   014264          R6      =%000006
COPTST  005362          GENRX   004632          MKBI    015467          M93     013342          R7      =%000007
CR      =000015         GETCHR  013052          MKBJ    015522          M94     013404          SAVE1   001322
CR_F    =000200         GIN     001426          MKBK    015555          M96     013435          SAVE2   001324
CRLFA   016474          GINA    001434          MKBL    015611          M97     013470          SAVE3   001326
CRLFB   016463          GOAPMD  020054          MKBM    015644          M98     020110          SAVE4   001330
D       007576          GODSHS  020026          MKBN    015700          NOWEOP  007050          SBEGIN  002006
DCATST  004462          GOHOSC  020000          MKBO    015773          OCTAL   011462          SET     004752
DCISP   =177570         GONAPM  020061          MKBQA   016040          OUT     021777          SHBE    021766
DELAY   011262          GOOD    025234          MKBQB   016052          OUTPUT  012400          STACK   =001100
DH      020570          GOPRNT  017752          MKBG1   016034          OVRAL   004754          STCHAR  001306
```

```
STKLMT= 177774
SUBTST  001256
SVR     001140
SVREG   000176
SW0   = 000001
SW00  = 000001
SW01  = 000002
SW02  = 000004
SW03  = 000010
SW04  = 000020
SW05  = 000040
SW06  = 000100
SW07  = 000200
SW08  = 000400
SW09  = 001000
SW1   = 000002
SW10  = 002000
SW11  = 004000
SW12  = 010000
SW13  = 020000
SW14  = 040000
SW15  = 100000
SW2   = 000004
SW3   = 000010
SW4   = 000020
SW5   = 000040
SW6   = 000100
SW7   = 000200
SW8   = 000400
SW9   = 001000
TBITVE= 000014
TEMP    001312
TEMP0   001314
TIME0   001254
TIME1   013124
TIME2   013126
TITLE   013144
TKVEC = 000060
TOTALC  001264
TPVEC = 000064
TRAPVE= 000034
TRTVEC= 000014
TSTDAT  012270
TSTKPS  012164
TSTNUM  001252
TSTROW  011560
TST1    002042
TST10   003776
TST11   004154
TST12   004302
TST13   003400
TST14   005100
TST15   005250
TST16   005362
TST17   005532
TST2    002466
TST20   005566
TST21   005656
TST22   006010
TST23   006144
TST24   006266
TST25   006344
TST26   006456
TST27   006512
TST3    002506
TST30   007106
TST31   007402
TST32   010076
TST4    002562
TST5    002662
TST6    002764
TST7    003426
TYPOS = 104405
TYPE  = 104401
TYPEPT  002404
TYPOC = 104402
TYPON = 104404
TYPOS = 104403
VH0     001266
VH1     001270
VH2     001272
VTIB    001300
VTIS    001276
VTNOW   001246
VT0B    001304
VT0S    001302
VT5XX   001260
VT50A   016760
VT50B   017032
VT50H   017163
VT52K   017241
VT52L   017324
VT52M   017405
VT52S   017101
VT52Z   017466
VSORW   020774
VS2RW   021012
WFTEST  001332
WHATO   020156
WHATI   020221
WHERE   002402
WIDTH   001320
XADDS   004750
XOFF  = 000023
XOFFBR  010652
XOFFOK  010654
XOFFRC  010660
XON   = 000021
XONRC   010662
XPRNT   010236
XPRNTA  010242
XPRNTB  010260
YADDS   004746
$AUTOB  001134
$BDADR  001122
$BDDAT  001126
$CHARC  024424
$CMTAG  001100
$CM1  = 000002
$CM2  = 000004
$CM3  = 000002
$CNTLG  023421
$CNTLU  023414
$CRLF   001167
$DBLK   013000
$DOAGN  007024
$DTBL   012770
$ENDAD  007014
$ENDCT  006762
$ENDMG  007033
$ENULL  007030
$EOP    006744
$EOPCT  006754
$ERFLG  001103
$ERMAX  001115
$ERROR  023742
$ERRPC  001116
$ERRTB  001172
$ERRTY  024054
$ERTTL  001112
$FILLC  001155
$FILLS  001154
$GOADR  001120
$GODAT  001122
$GET2   007044
$HO   = 000000
$HINUM  024754
$HIOCT  023606
$ICNT   001104
$ILLUP  025176
$INTAG  001135
$ITEMB  001114
$LF     001170
$LONUM  024756
$LPADR  001106
$LPSKR  001110
$MNEW   023437
$MSWR   023426
$NULL   001154
$NWTST= 000001
$OCNT   024652
$OMODE  024654
$OVER   023726
$PASS   001100
$POWER  025204
$PWRDN  025036
$PWRMG  025172
$PWRUP  025110
$QUES   001166
$RAND   024656
$ROCHR  023156
$ROLIN  023276
$ROOCT  023450
$ROSIZ  = 000010
$RTNAD  001160
$RTNO   001162
$RTNI   001164
$RTNAO  007026
$SAVRG  025202
$SCOPE  023624
$SETUP= 000037
$STUP   = 177777
$SVLAD  023712
$SWR    = 160400
$SWRMK= 000000
$TKB    001146
$TKS    001144
$TN     = 000033
$TPB    001152
$TPFLG  001157
$TPS    001150
$TRAP   024760
$TRAP2  025002
$TRP    = 000011
$TRPAD  025014
$TSTNM  001102
$TTYIN  023404
$TYPOS  012564
$TYPE   024210
$TYPEC  024360
$TYPEX  024426
$TYPOC  024454
$TYPON  024470
$TYPOS  024430
$XTSTR  023634
$$GET4= 000000
$OFILL  024653
.       = 025260
```

. ABS. 025260 000

ERRORS DETECTED: 0

DZVTCE,DZVTCE.SEQ=DZVTCE
RUN-TIME: 20 10 .5 SECONDS
RUN-TIME RATIO: 457/31=14.3
CORE USED: 24K (47 PAGES)

E06