IDENTIFICATION

PRODUCT CODE:	MAINDEC-11-DZVTC-C
PRODUCT NAME:	VT50A, B, K, 52 ACCEPTANCE TEST
DATE CREATED:	MAY 21, 1975
DATE REVISED:	OCTOBER, 1975
MAINTAINER:	DIAGNOSTIC GROUP
AUTHOR:	P NELSON/R SHOOP

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 09 = 1		LOOP ON TEST IN SWR <4:0>
SW 08 = 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 AT 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 CONNECTED
THE PROGRAM WILL TYPE 'END PASS' ON THE CONSOLE WHEN A PASS HAS BEEN COMPLETED.
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        CODES 52 AND 125
a?a?a?a?a?        CODES 77 AND 100
#U#U#U#U#U
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.

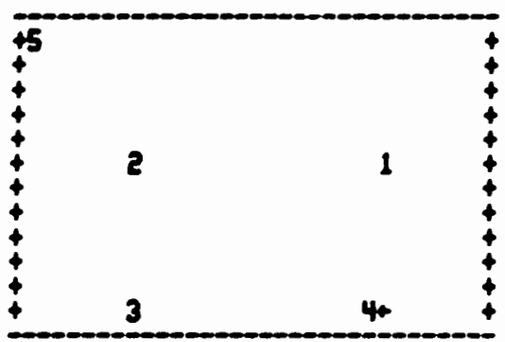
THIS PATTERN WILL VERIFY THAT THE FULL
CHARACTER SET CAN BE DISPLAYED IN EACH
SCREEN WORD.

9.6 F CURSOR MOTION

H01

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"

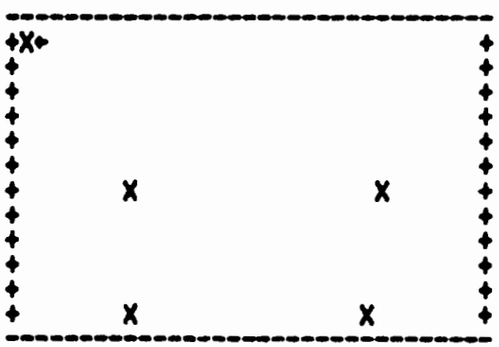
TO TEST "CURSOR LEFT": GENERATE CURSOR LEFT (BACKSPACE) FOURTY FOUR TIMES AND DISPLAY A "X"

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' CHAR.
THE BELL WILL RING AT THE BEGINNING OF EACH LINE. THE SECOND SECTION TESTS
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       + (REF.LINE USING SPACES)
+I       I       I       I       I       I       I       I       I       I       +
+IA      IA      IA      IA      IA      IA      IA      IA      IA      IA      +
+IAA     IAA     IAA     IAA     IAA     IAA     IAA     IAA     IAA     IAA     +
+IAAA    IAAA    IAAA    IAAA    IAAA    IAAA    IAAA    IAAA    IAAA    IAAA    +
+IAAAA   IAAAA   IAAAA   IAAAA   IAAAA   IAAAA   IAAAA   IAAAA   IAAAA   IAAAA   +
+IAAAAA  IAAAAA  IAAAAA  IAAAAA  IAAAAA  IAAAAA  IAAAAA  IAAAAA  IAAAAA  IAAAAA  +
+IAAAAAA IAAAAAA IAAAAAA IAAAAAA IAAAAAA IAAAAAA IAAAAAA IAAAAAA IAAAAAA IAAAAAA +

 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

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

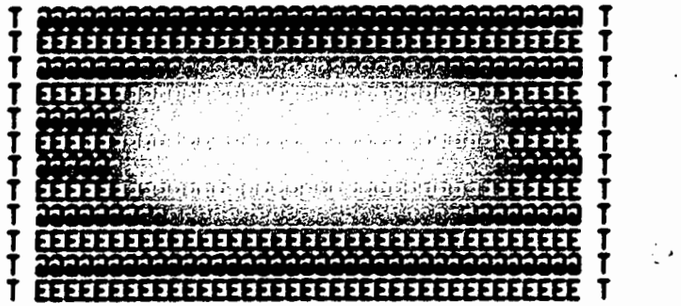
```
                                                                                X0 (BLANK LINE)
EEEEEE                                                                          X6
EEEEEEEEEEEE                                                                    X12
EEEEEEEEEEEEEEEEEE                                                              X18
EEEEEEEEEEEEEEEEEEEEEEEE                                                        X24
EEEEEEEEEEEEEEEEEEEEEEEEEEEEEE                                                  X30
EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE                                            X36
EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE                                      X42
EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE                                X48
EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE                          X54
EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE                    X60
EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE              X66
```

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 CORRECTLY.
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

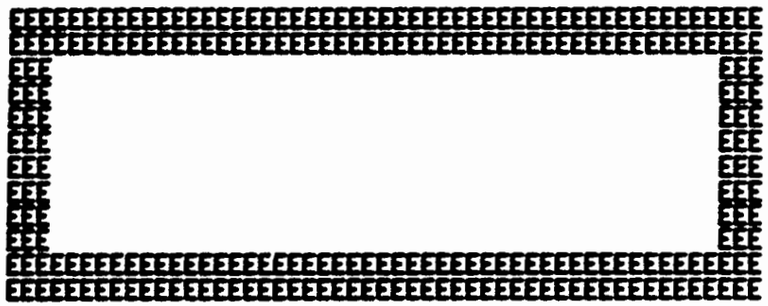
SAME AS SCREEN PATTERN

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 DISCLAIMER 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.

9.30 X KEYBOARD CHARACTER TEST

THIS TEST IS DESIGNED TO VERIFY THAT CORRECT CHARACTER CODES AND PARITY BIT ARE GENERATED WHEN A KEY IS DEPRESSED. THIS TEST REQUIRES THE OPERATOR TO EXECUTE THE INSTRUCTIONS DISPLAYED ON THE SCREEN. THE OPERATOR SHOULD ONLY DEPRESS ONE KEY AT A TIME, WITH SOME EXCEPTIONS. THE OPERATOR WILL BE REQUIRED TO SKIP THOSE KEYS THAT ARE NOT IMPLEMENTED IF THE UNIT IS A VT50. THE PROGRAM WILL INFORM THE OPERATOR WHICH ROW TO TEST.

IN TESTING THE PARITY BIT, SW 0 AND 1 ARE USED TO INFORM THE PROGRAM OF THE EXPECTED PARITY. AN INCORRECT SWITCH SETTING WILL RESULT IN AN ERROR.

9.31 Y KEYBOARD OCTAL VALUE LOOP

THIS LOOP IS PROVIDED TO ENABLE THE OPERATOR TO EXAMINE THE OCTAL VALUE OF A CHARACTER. WHEN A KEY IS DEPRESSED, THE OCTAL VALUE WILL BE DISPLAYED. IF THE CHARACTER WAS A PRINTABLE CHARACTER, IT WILL BE DISPLAYED. THOSE CODES DEFINED AS "CONTROL" WILL BE DISPLAYED AS A TWO LETTER MNEMONIC (IE. DE=DELETE, BL=BELL, CL=CURSOR LEFT ETC.)

9.32 Z KEYBOARD ECHO LOOP

WHEN A KEY IS DEPRESSED, THE CHARACTER WILL BE DISPLAYED. NO MODIFICATION OR DATA TEST IS PERFORMED. THIS TEST CAN BE USED TO DETERMINE IF THERE IS A "UART" OR SERIAL LINE PROBLEM. WHEN THE VT50/52 IS IN LOCAL MODE (NO UART/SERIAL LINE) THE CHARACTERS SHOULD BE ECHOED CORRECTLY. IF NOT, THE PROBLEM IS IN THE VT50 UNIT. IF CHANGED TO REMOTE MODE AND THE CHARACTERS ARE IN ERROR, THERE IS A UART/ SERIAL LINE PROBLEM.

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SW0-4 TEST LETTER TEST NAME
T1 A TERMINAL IDENTIFICATION TEST
T2 B FULL SCREEN OF A CHARACTER
T3 C DATA TRANSFER PATH TEST
T4 D SINGLE CHARACTER ACROSS ALL COLS. <ALL CHARACTERS>
T5 E ROTATING CHARACTERS ACROSS ALL COLS. <ALL CHARACTERS>
T6 F CURSOR MOTION TEST
T7 G TAB, BACKSPACE AND BELL TEST
T10 H ERASE FROM CURSOR TO END OF LINE
T11 I ERASE FROM CURSOR TO END OF SCREEN
T12 J VIDEO COUPLING TEST
T13 K DIRECT CURSOR ADDRESS TEST
T14 L HOLD SCREEN TEST
T15 M TEST GRAPHICS MODE AND REV. LINE FEED
T16 N COPIER - AUTO COPY TEST
T17 O COPIER - FULL SCREEN OF A CHARACTER
T20 P COPIER - DATA PATH TEST
T21 Q COPIER - SINGLE CHARACTER ACROSS ALL COLS. <ALL CHARACTERS>
T22 R COPIER - ROTATING CHARACTERS ACROSS ALL COLS. <ALL CHARACTERS>
T23 S COPIER - PERIMETER PATTERN
T24 T COPIER - DISCLAIMER STATEMENT
T25 U PRINTER CONTROLLER MODE TEST
T26 V PRINT SCREEN TEST
T27 W AUTO PRINT TEST
END OF PASS ROUTINE

T30 X KEYBOARD OCTAL VALUE LOOP
T31 Y KEYBOARD CHARACTER TEST
T32 Z KEYBOARD ECHO LOOP

CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
ASCII MESSAGES
KEYBOARD CHARACTER CODE TABLES
TTY INPUT ROUTINE
READ AN OCTAL NUMBER FROM THE TTY
SCOPE HANDLER ROUTINE
ERROR HANDLER ROUTINE
ERROR MESSAGE TYPEOUT ROUTINE
TYPE ROUTINE
BINARY TO OCTAL (ASCII) AND TYPE
RANDOM NUMBER GENERATOR ROUTINE
TRAP DECODER
(3) TRAP TABLE
1059 POWER DOWN AND UP ROUTINES

```
                        .TITLE  MAINDEC-11-DZVTC-C
                        ;*COPYRIGHT (C) 1975
                        ;*DIGITAL EQUIPMENT CORP.
                        ;*MAYNARD, MASS. 01754
                        ;*
                        ;*PROGRAM BY RAYMOND SHOOP
                        ;*
                        ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
                        ;*PACKAGE (MAINDEC-11-DZQAC-B).
                        ;*

                        .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
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 SWITCH 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
                        .EQUIV  R6,SP           ;;STACK POINTER
                        .EQUIV  R7,PC           ;;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
```

```
MAINDEC-11-DZVTC-C     MACY11 27(732)  24-AUG-76  14:41  PAGE 1-1                SEQ 0015
DZVTCC.P13     BASIC DEFINITIONS

(1)            000100                  SW06=   100
(1)            000040                  SW05=   40
(1)            000020                  SW04=   20
(1)            000010                  SW03=   10
(1)            000004                  SW02=   4
(1)            000002                  SW01=   2
(1)            000001                  SW00=   1
(1)                                    .EQUIV  SW09,SW3
(1)                                    .EQUIV  SW08,SW2
(1)                                    .EQUIV  SW07,SW1
(1)                                    .EQUIV  SW06,SW0
(1)                                    .EQUIV  SW05,SW5
(1)                                    .EQUIV  SW04,SW4
(1)                                    .EQUIV  SW03,SW3
(1)                                    .EQUIV  SW02,SW2
(1)                                    .EQUIV  SW01,SW1
(1)                                    .EQUIV  SW00,SW0
(1)
(1)                                    ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
(1)            100000                  BIT15=  100000
(1)            040000                  BIT14=  40000
(1)            020000                  BIT13=  20000
(1)            010000                  BIT12=  10000
(1)            004000                  BIT11=  4000
(1)            002000                  BIT10=  2000
(1)            001000                  BIT09=  1000
(1)            000400                  BIT08=  400
(1)            000200                  BIT07=  200
(1)            000100                  BIT06=  100
(1)            000040                  BIT05=  40
(1)            000020                  BIT04=  20
(1)            000010                  BIT03=  10
(1)            000004                  BIT02=  4
(1)            000002                  BIT01=  2
(1)            000001                  BIT00=  1
(1)                                    .EQUIV  BIT09,BIT9
(1)                                    .EQUIV  BIT08,BIT8
(1)                                    .EQUIV  BIT07,BIT7
(1)                                    .EQUIV  BIT06,BIT6
(1)                                    .EQUIV  BIT05,BIT5
(1)                                    .EQUIV  BIT04,BIT4
(1)                                    .EQUIV  BIT03,BIT3
(1)                                    .EQUIV  BIT02,BIT2
(1)                                    .EQUIV  BIT01,BIT1
(1)                                    .EQUIV  BIT00,BIT0
(1)
(1)                                    ;*BASIC "CPU" TRAP VECTOR ADDRESSES
(1)            000004                  ERRVEC=  4              ;;TIME OUT AND OTHER ERRORS
(1)            000010                  RESVEC=  10             ;;RESERVED AND ILLEGAL INSTRUCTIONS
(1)            000014                  TBITVEC=14              ;;"T" BIT
(1)            000014                  TRTVEC=  14             ;;TRACE TRAP
(1)            000014                  BPTVEC=  14             ;;BREAKPOINT TRAP (BPT)
(1)            000020                  IOTVEC=  20             ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
(1)            000024                  PWRVEC=  24             ;;POWER FAIL
(1)            000030                  EMTVEC=  30             ;;EMULATOR TRAP (EMT) **ERROR**
(1)            000034                  TRAPVEC=34              ;;"TRAP" TRAP
```

```
(1)             000060                  TKVEC=  60              ;;TTY KEYBOARD VECTOR
(1)             000064                  TPVEC=  64              ;;TTY PRINTER VECTOR
(1)             000240                  PIRQVEC=240             ;;PROGRAM INTERRUPT REQUEST VECTOR
 13
 14
(1)                                     .SBTTL  OPERATIONAL SWITCH SETTINGS
(1)                                     ;*
(1)                                     ;*      SWITCH                  USE
(1)                                     ;*      ------                  ---
(1)                                     ;*        15                    HALT ON ERROR
(1)                                     ;*        14                    LOOP ON TEST
(1)                                     ;*        13                    INHIBIT ERROR TYPEOUTS
(1)                                     ;*        12                    INHIBIT SUB-TEST DELAY'S
(1)                                     ;*        10                    ENABLE SAVE COPIER PAPER MODE
(1)                                     ;*        8                     LOOP ON TEST IN SWR<7:0>
 15
(1)                                     .SBTTL  TRAP CATCHER
(1)
(1)             000000                          .=0
(1)                                     ;#ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
(1)                                     ;#SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
(1)                                     ;#LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
(1)
(1)                                     .SBTTL  STARTING ADDRESS(ES)
(1)             000200                          .=200
(1)
(1)   000200  000137  001336                   JMP     @#BEGIN         ;;JUMP TO STARTING ADDRESS OF PROGRAM
 16   000204  000137  001402                   JMP     #BEGIN          ;JUMP TO RESTART ADDRESS
 17   000210  000137  001426                   JMP     BEGIN1          ;JUMP TO KEYBOARD CHARACTER TEST
 18   000214  000137  001436                   JMP     BEGIN2          ;JUMP TO CHAR OCTAL VALUE LOOP
 19   000220  000137  001416                   JMP     BEGIN3          ;JUMP TO ASCII ECHO LOOP
 20   000224  000137  001376                   JMP     MANFU           ;JUMP TO M.F. SPECIAL TEST PARAM.
```

```
    21                          ;*************************************************************
    (1)
    (1)                         .SBTTL  COMMON TAGS
    (1)
    (1)                         ;*THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
    (1)                         ;*USED IN THE PROGRAM.
    (1)
    (1)          001100                 .=1100
    (1) 001100   177570         SWR:    .WORD   DSWR            ;; OF SWITCH REGISTER
    (1) 001102   177570         DISPLAY: .WORD  DDISP           ;; OF DISPLAY REGISTER
    (1) 001104                  $CMTAG:                         ;;START OF COMMON TAGS
    (1) 001104   000000         $PASS:  .WORD   0               ;;CONTAINS PASS COUNT
    (1) 001106      000         $TSTNM: .BYTE   0               ;;CONTAINS THE TEST NUMBER
    (1) 001107      000         $ERFLG: .BYTE   0               ;;CONTAINS ERROR FLAG
    (1) 001110   000000         $ICNT:  .WORD   0               ;;CONTAINS SUBTEST ITERATION COUNT
    (1) 001112   000000         $LPADR: .WORD   0               ;;CONTAINS SCOPE LOOP
    (1) 001114   000000         $LPERR: .WORD   0               ;;CONTAINS SCOPE RETURN FOR ERRORS
    (1) 001116   000000         $ERTTL: .WORD   0               ;;CONTAINS TOTAL ERRORS DETECTED
    (1) 001120      000         $ITEMB: .BYTE   0               ;;CONTAINS ITEM CONTROL BYTE
    (1) 001121      001         $ERMAX: .BYTE   1               ;;CONTAINS MAX. ERRORS PER TEST
    (1) 001122   000000         $ERRPC: .WORD   0               ;;CONTAINS PC OF LAST ERROR INSTRUCTION
    (1) 001124   000000         $GDADR: .WORD   0               ;;CONTAINS  OF 'GOOD' DATA
    (1) 001126   000000         $BDADR: .WORD   0               ;;CONTAINS  OF 'BAD' DATA
    (1) 001130   000000         $GDDAT: .WORD   0               ;;CONTAINS 'GOOD' DATA
    (1) 001132   000000         $BDDAT: .WORD   0               ;;CONTAINS 'BAD' DATA
    (1) 001134   000000                 .WORD   0               ;;RESERVED--NOT TO BE USED
    (1) 001136   000000         $SWREG: .WORD   0               ;;SOFTWARE SWITCH REG
    (1) 001140   000000         $DISPLAY:       .WORD   0       ;;DISPLAY REG
    (1) 001142   177560         $TKS:   177560                  ;;TTY KBD STATUS
    (1) 001144   177562         $TKB:   177562                  ;;TTY KBD BUFFER
    (1) 001146   177564         $TPS:   177564                  ;;TTY PRINTER STATUS REG.
    (1) 001150   177566         $TPB:   177566                  ;;TTY PRINTER BUFFER REG.
    (1) 001152      000         $NULL:  .BYTE   0               ;;CONTAINS NULL CHARACTER FOR FILLS
    (1) 001153      002         $FILLS: .BYTE   2               ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
    (1) 001154      012         $FILLC: .BYTE   12              ;;INSERT FILL CHARS. AFTER A "LINE FEED"
    (1) 001155      000         $TPFLG: .BYTE   0               ;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
    (1) 001156   000000         $REGAD: .WORD   0               ;;CONTAINS THE  FROM
    (1)                                                         ;;WHICH ($REG0) WAS OBTAINED
    (3) 001160   000000         $REG0:  .WORD   0               ;;CONTAINS (($REGAD)+0)
    (3) 001162   000000         $REG1:  .WORD   0               ;;CONTAINS (($REGAD)+2)
    (1) 001164      077         $QUES:  .ASCII  /?/             ;;QUESTION MARK
    (1) 001165      015         $CRLF:  .ASCII  <15>            ;;CARRIAGE RETURN
    (1) 001166   000012         $LF:    .ASCIZ  <12>            ;;LINE FEED
```

```
(2)                                 ;*****************************************************************
(1)
(1)                                 .SBTTL  ERROR POINTER TABLE
(1)
(1)                                 ;*THIS TABLE CONTAINS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.
(1)                                 ;*THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN
(1)                                 ;*LOCATION SITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
(1)                                 ;*NOTE1:        IF SITEMB IS 0 THE ONLY PERTINENT DATA IS (SERRPC).
(1)                                 ;*NOTE2:        EACH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:
(1)
(1)                                 ;*      EM              ;;POINTS TO THE ERROR MESSAGE
(1)                                 ;*      DH              ;;POINTS TO THE DATA HEADER
(1)                                 ;*      DT              ;;POINTS TO THE DATA
(1)                                 ;*      DF              ;;POINTS TO THE DATA FORMAT
(1)
(1)
(1)  001170                         SERRTB:
(1)
(1)                                 ;ITEM   1
(1)  001170  017664                         EM1             ;ERROR FLAG ON HOST TRANSMIT STATUS
(1)  001172  020107                         DH1             ;ERRPC  VTNOW   TSTNUM
(1)  001174  020254                         DT1             ;SERRPC VTNOW   TSTNUM
(1)  001176  000000                         0
(1)
(1)                                 ;ITEM   2
(1)  001200  017731                         EM2             ;NO HOST INPUT FLAG RECEIVED
(1)  001202  020107                         DH1             ;ERRPC  VTNOW   TSTNUM
(1)  001204  020254                         DT1             ;SERRPC VTNOW   TSTNUM
(1)  001206  000000                         0
(1)
(1)                                 ;ITEM   3
(1)  001210  017760                         EM3             ;INCORRECT I.D. RESPONSE
(1)  001212  020136                         DH3             ;ERRPC  VTNOW   1ST WD  2ND WD  3RD WD
(1)  001214  020264                         DT3             ;SERRPC VTNOW   SAVE4   SAVE2   SAVE3
(1)  001216  000000                         0
(1)
(1)                                 ;ITEM   4
(1)  001220  020004                         EM4             ;INCORRECT OR UNEXPECTED INPUT CHARACTER
(1)  001222  020205                         DH4             ;ERRPC  VTNOW   TSTNUM   EXPT    RCVD
(1)  001224  020300                         DT4             ;SERRPC VTNOW   TSTNUM   SGDDAT SBDDAT
(1)  001226  000000                         0
(1)
(1)                                 ;ITEM   5
(1)  001230  020047                         EM5             ;INVALID BUSS ADDRESS, TRY AGAIN
(1)  001232  000000                         0
(1)  001234  000000                         0
(1)  001236  000000                         0
(1)  001240  177560                 FIRST:  177560                  ;FIRST DEVICE ADDRESS OF SEQUIENTAL DL-11-A/B TYPE DEVIC
(1)                                                                 ;DEFAULT TO THE CONSOLE ADDRESS
(1)  001242  000000                 LAST:   0                       ;LAST DEVICE ADDRESS OF DL-11-A/B TYPE
(1)  001244  177560                 VTNOW:  177560                  ;CURRENT DEVICE BUSS ADDRESS
(1)  001246  100011                 PTCT:   100011                  ;COPIER PAPER SAVE COUNT (LOW BYTE)
(1)  001250  000000                 TSTNUM: 0                       ;ERROR PATTERN
(1)
(1)  001252  000300                 TIMEO:  300                     ;CHARACTER FLAG TIMEOUT CONSTANT
```

```
                                SUBTST: 5                       ;SUBTEST DELAY CONSTANT
                                VTSXX:  0                       ;T.D. AND CHARACTICS
                                LASTLN: 53      ;OR 67          ;LAST VALID LINE # +40
                                TOTALC: 960.    ;OR 1920.       ;TOTAL CHARACTER COUNT
                                VHO:    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

001332  022626                  BUSSTR: CMP     (SP)+,(SP)+             ;POP STACK
001334  104005                          ERROR   5                       ;INVALID BUSS ADDRESS

001336  012737  001760  001756  BEGIN:  MOV     #TST1,WHERE     ;STARTING ACCEPTANCE TEST ADDRESS
001344  005037  001326          CLR     SAVE4
001350  005037  001330          CLR     WFTEST
001354  012737  001332  000004  MOV     #BUSSTR,@#4
001362  012737  000340  000006  MOV     #340,@#6
001370  005037  001272          CLR     PRTCNT
001374  000426                  BR      GINA
001376  005237  001330  MANFU:  INC     WFTEST          ;SET W.F. PARAM.
001402  005037  001272  RBEGIN: CLR     PRTCNT          ;RESTART ADDRESS
001406  012737  001760  001756  MOV     #TST1,WHERE
001414  000413                  BR      GIN
001416  012737  010172  001756  BEGIN3: MOV     #KRBECH,WHERE   ;START AT ECHO LOOP
001424  000407                  BR      GIN
001426  012737  007316  001756  BEGIN1: MOV     #KRBTST,WHERE   ;STARTING CHARACTER TEST ADDRESS
001434  000403                  BR      GIN
001436  012737  007022  001756  BEGIN2: MOV     #KRBECO,WHERE   ;STARTING CHARACTER LOOP ADDRESS
001444  012737  000001  001326  GIN:    MOV     #1,SAVE4
001452  000005                  GINA:   RESET
001454  012737  000340  177776          MOV     #340,@#PS       ;;LOCK OUT ALL INTERRUPTS
(1) 001462  012706  001104              MOV     #SCNTAG,R6      ;;FIRST LOCATION TO BE CLEARED
(1) 001466  005026                      CLR     (R6)+           ;;CLEAR MEMORY LOCATION
(1) 001470  022706  001132              CMP     #SBOOAT,R6      ;;DONE?
(1) 001474  001374                      BNE     .-6             ;;LOOP BACK IF NO
(1) 001476  012706  001100              MOV     #STACK,SP       ;;SETUP THE STACK POINTER
(1) 001502  012737  022724  000020      MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
(1) 001510  012737  000340  000022      MOV     #340,@#IOTVEC+2 ;;LEVEL 7
(1) 001516  012737  023042  000030      MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
(1) 001524  012737  000340  000032      MOV     #340,@#EMTVEC+2 ;;LEVEL 7
(1) 001532  012737  024110  000034      MOV     #STRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
```

```
(1)  001540  012737  000340  000036          MOV     #340,@#TRAPVEC+2;LEVEL 7
(1)  001546  012737  024152  000024          MOV     #SPWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
(1)  001554  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;LEVEL 7
(1)  001562  013737  006674  006666          MOV     $ENDCT,$EOPCT   ;;SET UP END-OF-PROGRAM COUNTER
(1)  001570  012737  001570  001112          MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
113  001576  005037  010760                  CLR     *#NORE
114  001602  005037  010742                  CLR     LOOP
115  001606  012737  022710  000020          MOV     #MSCOPE,@#IOTVEC
116  001614  005737  001326                  TST     SAVE4           ;TEST FLAG
117  001620  001036                          BNE     $BEGIN          ;BR IF NON-ZERO
118  001622  104400                          TYPE
119  001624  012630                          TITLE
120  001626  105777  177246                  TSTB    @#SWR
121  001632  100031                          BPL     $BEGIN          ;BR IF CLEARED
122  001634  104400                  11$:    TYPE
123  001636  017475                          WHATO                   ;FIND OUT THE DEVICE ADDRESS
124  001640  104407                          RDOCT
125  001642  012637  001240                  MOV     (SP)+,FIRST     ;SAVE THE ADDRESS
126  001646  022737  160000  001240          CMP     #160000,FIRST
127  001654  101367                          BHI     11$             ;BR IF INVALID
128  001656  005777  177356                  TST     @#FIRST         ;TEST IF VALID
129  001662  005037  001242                  CLR     LAST
130  001666  104400                          TYPE
131  001670  017540                          WHAT1                   ;FIND OUT THE LAST ADDRESS
132  001672  104407                          RDOCT
133  001674  012637  001242                  MOV     (SP)+,LAST      ;SAVE LAST ADDRESS
134  001700  005777  177336                  TST     @#LAST          ;TEST IF VALID
135  001704  012737  000006  000004          MOV     #6,@#4
136  001712  005037  000006                  CLR     @#6
137  001716  013737  001240  001244  $BEGIN: MOV     FIRST,VTNOW     ;LOAD INITIAL DEVICE ADDRESS
138
139  001724  012700  001274          RSTRT:  MOV     #VTIS,R0        ;LOAD POINTER
140  001730  013701  001244                  MOV     VTNOW,R1        ;LOAD INPUT STAT
141  001734  010120                          MOV     R1,(R0)+
142  001736  005721                          TST     (R1)+
143  001740  010120                          MOV     R1,(R0)+
144  001742  005721                          TST     (R1)+
145  001744  010120                          MOV     R1,(R0)+
146  001746  005721                          TST     (R1)+
147  001750  010110                          MOV     R1,(R0)
148  001752  000177  000000                  JMP     @#WHERE         ;JUMP TO STARTING ADDRESS
149  001756  001760                  WHERE:  TST1
150                                  ;#################################################################
(3)                                  ;#TEST 1        A       TERMINAL IDENTIFICATION TEST
(3)                                  ;#################################################################
(2)  001760  000004                  TST1:   SCOPE
155  001762  004537  011534                  JSR     R5,AMSG         ;DISPLAY HEADER
156  001766  013342                          M914
157  001770  004537  011534                  JSR     R5,AMSG         ;SEND REQUEST FOR IDENTIFICATION
158  001774  017070                          RFI
159
160  001776  004737  012536                  JSR     PC,GETCHR       ;GET A CHARACTER
161  002002  000537                          BR      2$              ;;BR BACK IF NO INPUT
162  002004  010037  001326                  MOV     R0,SAVE4        ;SAVE RESPONSE
163  002010  004737  012536                  JSR     PC,GETCHR       ;GET A CHAR.
164  002014  000532                          BR      2$              ;;BR IF NO INPUT
```

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MAINDEC-11-DZVTC-C     MACY11 27(732)  24-AUG-76  14:41  PAGE 1-7                                SEQ 0021
DZVTCC.P13      T1     A       TERMINAL IDENTIFICATION TEST

 165  002016  010037  001322                    MOV     R0,SAVE2
 166  002022  004737  012536                    JSR     PC,GETCHR       ;GET A CHAR.
 167  002026  000525                            BR      2$              ;;BR IF NO INPUT
 168  002030  010037  001324                    MOV     R0,SAVE3
 169  002034  042737  177600  001326            BIC     #177600,SAVE4   ;MASK BIT 7
 170  002042  042737  177600  001322            BIC     #177600,SAVE2
 171  002050  042737  177600  001324            BIC     #177600,SAVE3
 172  002056  005737  001330                    TST     NFTEST
 173  002062  001402                            BEQ     10$
 174  002064  004737  011462                    JSR     PC,ADELAY       ;EXTRA DELAY
 175  002070  122737  000033  001326  10$:      CMPB    #33,SAVE4       ;TEST FIRST CHAR.
 176  002076  001015                            BNE     1$              ;BR TO ERROR
 177  002100  122737  000057  001322            CMPB    #'/,SAVE2       ;TEST SECOND CHAR.
 178  002106  001011                            BNE     1$              ;BR TO ERROR
 179
 180                                    ;NOW DETERMINE WHICH VT5XX AND ITS CHARASTICS
 181
 182  002110  005000                            CLR     R0              ;CLEAR INITIAL POINTER
 183  002112  126037  002316  001324  3$:       CMPB    TYPEPT(R0),SAVE3        ;TEST I.D. TO KNOWN VALUE
 184  002120  001406                            BEQ     4$              ;BR IF CORRECT
 185  002122  005720                            TST     (R0)+           ;BUMP THE INDEX
 186  002124  105760  002316                    TSTB    TYPEPT(R0)      ;CHECK IF MORE VALID I.D.'S
 187  002130  001370                            BNE     3$              ;BR IF MORE
 188  002132  104003                    1$:     ERROR   3               ;INCORRECT I.D. CODE
 189  002134  005000                    11$:    CLR     R0              ;DEFAULT TO VT50A MODE
 190
 191                                    ;HAVE NOW FOUND THE I.D. - REPORT TO CONSOLE
 192
 193  002136  016037  002316  001256  4$:       MOV     TYPEPT(R0),VT5XX        ;SAVE I.D. AND CHARASTICS
 194  002144  016037  002350  002160            MOV     MSGTYP(R0),5$           ;SAVE ASCII MESSAGE POINTER
 195  002152  001403                            BEQ     13$             ;BR IF ZERO MESSAGE POINTER
 196  002154  004537  011534                    JSR     R5,AMSG         ;TELL THE UUT
 197  002160  016376                    5$:     VT50A                   ;POINTER TO VT5XX MESSAGE
 198
 199  002162  012737  [illegible]  001262  13$:      MOV     #960.,TOTALC            ;LOAD TOTAL CHARACTER COUNT
 200  002170  012737  000014  001264            MOV     #12.,VHO        ;LOAD MAX VERTICAL LINE COUNT
 201  002176  012737  000053  001260            MOV     #53,LASTLN      ;LOAD LAST LINE VALUE +40 FOR DCA TESTING
 202  002204  005737  001256                    TST     VT5XX           ;TEST IF 24 LINES AVAIL
 203  002210  100007                            BPL     6$              ;BR IF NOT
 204  002212  006337  001262                    ASL     TOTALC          ;ADJUST CHARACTER COUNT
 205  002216  006337  001264                    ASL     VHO             ;ADJUST LINE COUNT
 206  002222  062737  000014  001260            ADD     #12.,LASTLN     ;ADJUST VALID LINE # +40
 207
 208  002230  013737  001264  001266  6$:       MOV     VHO,VH1         ;LOAD OTHER LINE COUNTS
 209  002236  006237  001266                    ASR     VH1
 210  002242  013737  001266  001270            MOV     VH1,VH2
 211  002250  006237  001270                    ASR     VH2
 212  002254  012737  000140  001306            MOV     #140,LASTCH     ;LOAD FIRST NON-VALID CHARACTER
 213  002262  032737  004000  001256            BIT     #BIT11,VT5XX    ;TEST IF UPPER-LOWER CASE TERM.
 214  002270  001403                            BEQ     7$              ;BR IF NOT
 215  002272  062737  000040  001306            ADD     #40,LASTCH      ;UPDATE TO ALLOW UP-LW CASE CHARACTER SET
 216  002300                    7$:
 (1)  002300  000403                            BR      12$             ;;BR AND START TESTING
 217
 218  002302  104002                    2$:     ERROR   2               ;NO RESPONSE FROM UUT AFTER ASKING FOR IDENTIFY
 219  002304  000713                            BR      11$
```

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MAINDEC-11-DZVTC-C     MACY11 27(732)  24-AUG-76  14:41  PAGE 1-8                    SEQ 0022
DZVTCC.P13      T1     A       TERMINAL IDENTIFICATION TEST

                002306  000240                  NOP
                002310  004737  011354  125:    JSR     PC,DELAY
                002314  000431                  BR      TST2            ;;BR AND START TESTING

                                        ;I.D. VALUES AND CHARACTERISTICS
                                        ;       BIT15 = 1       24 LINES
                                        ;       BIT14 = 1       COPIER CONNECTED
                                        ;       BIT13 = 1       DIRECT CURSOR ADDRESSING (ESC Y) + "ESC-8" + "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??

                002316  000101  TYPEPT: .WORD   000101  ;I.D. = 101      ;VT50A
                002320  040102          .WORD   040102  ;I.D. = 102      ;VT50B COPIER
                002322  140103          .WORD   140103  ;I.D. = 103      ;VT55 24. LINES, COPIER
                002324  070110          .WORD   070110  ;I.D. = 110      ;VT50H COPIER DCA VT50H KEYPAD
                002326  135113          .WORD   135113  ;I.D. = 113      ;VT52
                002330  175114          .WORD   175114  ;I.D. = =114     ;VT52 WITH COPIER
                002332  137115          .WORD   137115  ;I.D. = 115      ;VT52 WITH PRINTER.
                002334  000000          0
                002336  000000          0
                002340  000000          0
                002342  000000          0
                002344  000000          0
                002346  000000          0

                                        ;ASCII MESSAGE POINTERS

                002350  016376  MSGTYP: VT50A                   ;VT50A NO COPIER
                002352  016450          VT50B                   ;VT50B COPIER
                002354  016517          VT55                    ;VT55 COPIER
                002356  016565          VT50H                   ;VT50H COPIER
                002360  016643          VT52K                   ;VT52
                002362  016726          VT52L                   ;VT52 WITH COPIER
                002364  017007          VT52M                   ;VT52 WITH PRINTER
                002366  000000          0
                002370  000000          0
                002372  000000          0
                002374  000000          0
                002376  000000          0
                                        ;*****************************************************************
                                        ;*TEST 2         B       FULL SCREEN OF A CHARACTER
                                        ;*****************************************************************
                002400  000004  TST2:   SCOPE

                002402  004537  011534          JSR     R5,AMSG
                002406  012731                  M91

                002410  004737  012474          JSR     PC,FILLWC       ;FILL SCREEN WITH A 'E'S

                002414  004737  011354          JSR     PC,DELAY

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

```
                                        ;#TEST 3        C       DATA TRANSFER PATH TEST
                                        ;*************************************************************
                                TST3:   SCOPE
002420  000004
002422  004537  011534                          JSR     R5,AMSG         ;DISPLAY HEADING
002426  012777                                  M92
002430  013737  001266  001310                  MOV     VH1,TEMP        ;SET-UP A COUNTER

002436  004537  011246                          JSR     R5,DTPSR        ;SET-UP BUFFER
002442  000077                                  77                      ;OCTAL '?'
002444  000100                                  100                     ;OCTAL '@'

002446  004537  011252                          JSR     R5,DTPSR8       ;SET-UP BUFFER
002452  000125                                  125                     ;OCTAL 'U'
002454  000052                                  52                      ;OCTAL '*'

002456  004737  010330                  1$:     JSR     PC,XPRNT        ;DISPLAY THIS LINE
002462  005337  001310                          DEC     TEMP            ;COMPLETED FULL COUNT?
002466  001373                                  BNE     1$              ;BRANCH IF NOT COMPLETED

002470  004737  011354                          JSR     PC,DELAY        ;TEST DELAY SWITCH
                                        ;*************************************************************
                                        ;#TEST 4        D       SINGLE CHARACTER ACROSS ALL COLS. <ALL CHARACTERS>
                                        ;*************************************************************
                                TST4:   SCOPE
002474  000004
002476  004537  011534                          JSR     R5,AMSG         ;DISPLAY HEADING
002502  013026                                  M93
002504  012737  000040  001304                  MOV     #40,STCHAR      ;SET-UP STARTING CHARACTER

002512  013737  001264  001312                  MOV     VH0,TEMPO       ;LOAD COUNT
002520  013701  001304                  1$:     MOV     STCHAR,R1       ;LOAD R1= TO CHARACTER
002524  004737  010226                          JSR     PC,FILBUF       ;LOAD A BUFFER WITH THAT CHARACTER

002530  004737  010330                          JSR     PC,XPRNT        ;DISPLAY A FULL LINE FROM THE BUFFER

002534  005337  001312                          DEC     TEMPO           ;DONE ?
002540  001005                                  BNE     2$              ;FINISHED
002542  004737  011354                          JSR     PC,DELAY
002546  013737  001264  001312                  MOV     VH0,TEMPO
002554  005237  001304                  2$:     INC     STCHAR          ;UPDATE THE CHARACTER
002560  023737  001306  001304                  CMP     LASTCH,STCHAR   ;TEST FOR FINAL CHARACTER
002566  001354                                  BNE     1$              ;BRANCH IF NOT COMPLETED

002570  004737  011354                          JSR     PC,DELAY        ;TEST DELAY SWITCH

                                        ;*************************************************************
                                        ;#TEST 5        E       ROTATING CHARACTERS ACROSS ALL COLS. <ALL CHARACTERS>
                                        ;*************************************************************
002574  000004                          TST5:   SCOPE
002576  004537  011534                          JSR     R5,AMSG         ;DISPLAY HEADING
002602  013070                                  M94
002604  012737  000040  001304                  MOV     #40,STCHAR      ;SET-UP STARTING CHARACTER

002612  013737  001264  001312                  MOV     VH0,TEMPO       ;LOAD TEMP
002620  013701  001304                  1$:     MOV     STCHAR,R1       ;LOAD R1=TO CHARACTER
002624  004537  010262                          JSR     R5,LIC          ;LOAD A BUFFER STARTING WITH
002630  001316                                  WIDTH                   ; THAT CHARACTER AND WIDTH <BYTE>
```

```
002632  004737  010330                   JSR     PC,XPRNT        ;DISPLAY A FULL LINE FROM THE BUFFER

002636  005337  001312                   DEC     TEMPO           ;DONE ?
002642  001005                           BNE     2$              ;BR IF YES
002644  004737  011354                   JSR     PC,DELAY
002650  013737  001264  001312           MOV     VHO,TEMPO
002656  005237  001304          2$:      INC     STCHAR          ;UPDATE THE STARTING CHARACTER
002662  023737  001306  001304           CMP     LASTCH,STCHAR   ;TEST FOR FINAL CHARACTER
002670  001353                           BNE     1$              ;BRANCH IF NOT COMPLETED

002672  004737  011354                   JSR     PC,DELAY        ;TEST DELAY SWITCH

                                ;*************************************************************
                                ;*TEST 6         F       CURSOR MOTION TEST
                                ;*************************************************************
002676  000004                  TST6:    SCOPE
002700  004537  011534                   JSR     R5,AMSG         ;DISPLAY HEADING
002704  013121                           M96

                                ;ROUTINE TO LOAD REFERENCE LINES FOR CURSOR MOTION TEST

002706  012700  024312          LBMT:    MOV     #BUFFER,R0      ;LOAD POINTER
002712  012720  000065                   MOV     #65,(R0)+       ;LOAD #5
002716  013701  001266                   MOV     VH1,R1          ;LOAD R1
002722  005301                           DEC     R1
002724  004737  003022                   JSR     PC,MOVDN1       ;MOVE CURSOR DOWN
002730  004737  003040                   JSR     PC,MOVRIG       ;MOVE RIGHT
002734  112720  000062                   MOVB    #62,(R0)+       ;LOAD #2
002740  004737  003040                   JSR     PC,MOVRIG       ;MOVE RIGHT
002744  004737  003040                   JSR     PC,MOVRIG       ;MOVE RIGHT
002750  112720  000040                   MOVB    #40,(R0)+
002754  112720  000061                   MOVB    #61,(R0)+       ;LOAD #1
002760  004737  003016                   JSR     PC,MOVDWN       ;MOVE DOWN
002764  004737  003040                   JSR     PC,MOVRIG       ;MOVE RIGHT
002770  112720  000063                   MOVB    #63,(R0)+       ;LOAD #3
002774  004737  003040                   JSR     PC,MOVRIG
003000  004737  003040                   JSR     PC,MOVRIG       ;MOVE RIGHT
003004  112720  000064                   MOVB    #64,(R0)+       ;LOAD #4
003010  112710  000377                   MOVB    #377,(R0)       ;TERM
003014  000420                           BR      LBMT1           ;;BR TO NEXT PART

003016  013701  001266          MOVDWN:  MOV     VH1,R1
003022  112720  000015          MOVDN1:  MOVB    #15,(R0)+       ;LOAD CR
003026  112720  000012                   MOVB    #12,(R0)+       ;LOAD LF
003032  005301                           DEC     R1
003034  001372                           BNE     MOVDN1          ;LOOP UNTIL DONE
003036  000207                           RTS     PC              ;ESIT

003040  012701  000024          MOVRIG:  MOV     #20.,R1         ;LOAD R1
003044  112720  000040          1$:      MOVB    #40,(R0)+       ;LOAD SPACES
003050  005301                           DEC     R1
003052  100374                           BPL     1$              ;LOOP UNTIL DONE
003054  000207                           RTS     PC              ;EXIT

003056  004737  010330          LBMT1:   JSR     PC,XPRNT        ;DISPLAY THIS LINE
003062  004737  011354                   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
003066 013701 001266            LCM:    MOV     VH1,R1          ;LOAD COUNT
003072 012700 024312                    MOV     #BUFFER,R0      ;LOAD BUFFER POINTER
003076 112720 000033            1$:     MOVB    #33,(R0)+       ;LOAD 'ESC'
003102 112720 000101                    MOVB    #101,(R0)+      ;LOAD 'A' CURSOR UP
003106 005301                           DEC     R1
003110 001372                           BNE     1$              ;LOOP UNTIL DONE
003112 112720 000130                    MOVB    #130,(R0)+      ;LOAD 'X'
003116 012701 000054                    MOV     #44.,R1         ;LOAD COUNT
003122 032737 020000 001256             BIT     #BIT13,VT5XX    ;TEST IF VT50H TYPE
003130 001407                           BEQ     20$             ;BR IF NOT
003132 112720 000033            2$:     MOVB    #33,(R0)+       ;LOAD 'ESC'
003136 112720 000104                    MOVB    #104,(R0)+      ;LOAD 'CURSOR,LEFT'
003142 005301                           DEC     R1
003144 100372                           BPL     2$              ;LOOP UNTIL DONE
003146 000404                           BR      21$
003150 112720 000010            20$:    MOVB    #10,(R0)+       ;LOAD "BACKSPACE
003154 005301                           DEC     R1              ;DONE ALL ?
003156 100374                           BPL     20$             ;BR IF NOT
003160 112720 000130            21$:    MOVB    #130,(R0)+      ;LOAD 'X'
003164 112720 000010                    MOVB    #10,(R0)+       ;LOAD BACKSPACE
003170 013701 001266                    MOV     VH1,R1          ;LOAD COUNT
003174 032737 020000 001256             BIT     #BIT13,VT5XX    ;TEST IF VT50H TYPE
003202 001407                           BEQ     30$             ;BR IF NOT
003204 112720 000033            3$:     MOVB    #33,(R0)+       ;LOAD 'ESC' CURSOR DOWN
003210 112720 000102                    MOVB    #102,(R0)+
003214 005301                           DEC     R1
003216 001372                           BNE     3$              ;LOOP UNTIL DONE
003220 000404                           BR      31$
003222 112720 000012            30$:    MOVB    #12,(R0)+       ;LOAD CURSOR DOWN (LF)
003226 005301                           DEC     R1              ;DONE ?
003230 001374                           BNE     30$             ;BR IF NOT
003232 112720 000130            31$:    MOVB    #130,(R0)+      ;LOAD 'X'
003236 112720 000010                    MOVB    #10,(R0)+       ;LOAD BACKSPACE
003242 012701 000052                    MOV     #42.,R1         ;LOAD COUNT
003246 112720 000033            4$:     MOVB    #33,(R0)+       ;LOAD 'ESC'
003252 112720 000103                    MOVB    #103,(R0)+      ;LOAD 'C' CURSOR RIGHT
003256 005301                           DEC     R1
003260 100372                           BPL     4$              ;LOOP UNTIL DONE
003262 112720 000130                    MOVB    #130,(R0)+      ;LOAD 'X'
003266 112720 000033                    MOVB    #33,(R0)+       ;LOAD 'ESC'
003272 112720 000110                    MOVB    #110,(R0)+      ;LOAD 'H' CURSOR HOME
003276 112720 000130                    MOVB    #130,(R0)+
003302 112720 000377                    MOVB    #377,(R0)+
003306 004737 010330                    JSR     PC,XPRNT        ;DISPLAY THIS LINE
003312 004737 011354                    JSR     PC,DELAY        ;DELAY
003316 004537 011534                    JSR     R5,AMSG
003322 016101                           CRLF
003324 005737 001256                    TST     VT5XX           ;TEST IF 24 LINES
003330 100003                           BPL     TST7            ;BR IF 12 LINES
003332 004537 011534                    JSR     R5,AMSG         ;SCROLL MORE LINES
003336 016101                           CRLF

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

```
(3)                                     ;*TEST 7        G       TAB, BACKSPACE AND BELL TEST
(3)                                     ;*****************************************************************
(2) 003340 000004                       TST7:   SCOPE
    003342 004537 011534                        JSR     R5,AMSG         ;DISPLAY HEADING
    003346 013154                               M97
                                        
    003350 012700 024312                LRL:    MOV     #BUFFER,R0      ;LOAD BUFFER POINTER
    003354 112720 000007                        MOVB    #7,(R0)+        ;LOAD 'BELL'
    003360 012701 000011                        MOV     #9.,R1          ;LOAD LINE COUNT
    003364 012702 000006                1$:     MOV     #6.,R2          ;LOAD COLUMN COUNT
    003370 112720 000111                        MOVB    #111,(R0)+      ;LOAD COLUMN MARK
    003374 112720 000040                2$:     MOVB    #40,(R0)+       ;LOAD SPACE
    003400 005302                               DEC     R2              ;
    003402 100374                               BPL     2$              ;BR UNTIL DONE
    003404 005301                               DEC     R1              ;
    003406 100366                               BPL     1$              ;BR UNTIL FINISHED ALL TAB STOPS
    003410 112720 000015                        MOVB    #15,(R0)+       ;LOAD CR
    003414 112720 000012                        MOVB    #12,(R0)+       ;LOAD LF
    003420 112720 000377                        MOVB    #377,(R0)+      ;LOAD TERM
                                        
    003424 004737 010330                        JSR     PC,XPRNT
                                        
    003430 004537 003620                        JSR     R5,LTAB         ;LOAD TAB LINE #1
    003434 000000                               0
    003436 004737 010330                        JSR     PC,XPRNT        ;DISPLAY THIS LINE
                                        
    003442 004537 003620                        JSR     R5,LTAB         ;LOAD TAB LINE #2
    003446 000001                               1
    003450 004737 010330                        JSR     PC,XPRNT        ;DISPLAY THIS LINE
                                        
    003454 004537 003620                        JSR     R5,LTAB         ;LOAD TAB LINE #3
    003460 000002                               2
    003462 004737 010330                        JSR     PC,XPRNT        ;DISPLAY THIS LINE
                                        
    003466 004537 003620                        JSR     R5,LTAB         ;LOAD TAB LINE #4
    003472 000003                               3
    003474 004737 010330                        JSR     PC,XPRNT        ;DISPLAY THIS LINE
                                        
    003500 004537 003620                        JSR     R5,LTAB         ;LOAD TAB LINE #5
    003504 000004                               4
    003506 004737 010330                        JSR     PC,XPRNT        ;DISPLAY THIS LINE
                                        
    003512 004537 003620                        JSR     R5,LTAB         ;LOAD TAB LINE #6
    003516 000005                               5
    003520 004737 010330                        JSR     PC,XPRNT        ;DISPLAY THIS LINE
                                        
    003524 004537 003620                        JSR     R5,LTAB         ;LOAD TAB LINE #7
    003530 000006                               6
    003532 004737 010330                        JSR     PC,XPRNT        ;DISPLAY THIS LINE
                                        ;NOW EXECUTE THE BACKSPACE SECTION
                                        
    003536 013702 001316                        MOV     WIDTH,R2        ;LOAD WIDTH COUNT
    003542 005302                               DEC     R2              ;ADJUST WIDTH
    003544 005302                               DEC     R2              ;  BY 2
    003546 012701 000040                        MOV     #40,R1          ;LOAD "SPACE" INTO THE LINE
    003552 004737 010232                        JSR     PC,FILBFB       ;LOAD LINE
```

```
003556 013701 001316          MOV     WIDTH,R1        ;LOAD # OF CHARACTER POSITIONS
003562 112720 000130    3$:   MOVB    #'X,(R0)+       ;LOAD ASCII "X"
003566 112720 000010          MOVB    #10,(R0)+       ;LOAD BACKSPACE CODE
003572 112720 000010          MOVB    #10,(R0)+
003576 005301                 DEC     R1              ;DONE ALL POSITIONS ?
003600 001370                 BNE     3$              ;BR IF NOT
003602 112720 000377          MOVB    #377,(R0)+      ;LOAD TERM.
003606 004737 010330          JSR     PC,XPRNT        ;EXECUTE ASCII CODE
003613 004737 011354          JSR     PC,DELAY        ;TEST DELAY SWITCH
003616 000434                 BR      TST10           ;;BR TO NEXT TEST

                        ;SUBROUTINE TO LOAD THE TAB TEST INTO THE BUFFER

003620 012537 001320    LTAB: MOV     (R5)+,SAVE1     ;LOAD # OF CHARACTERS
003624 012702 024312          MOV     #BUFFER,R2      ;LOAD BUFFER POINTER
003630 012701 000011          MOV     #9.,R1          ;LOAD WIDTH COUNTER
003634 112722 000007          MOVB    #7,(R2)+        ;LOAD BELL AT START OF LINE
003640 112722 000111    3$:   MOVB    #11,(R2)+       ;LOAD 'I
003644 013700 001320          MOV     SAVE1,R0        ;GET THE  NO. OF THE CHAR
003650 001404                 BEQ     1$              ;BR IF 0
003652 112722 000101    2$:   MOVB    #101,(R2)+      ;LOAD THE 'A' CHAR.
003656 005300                 DEC     R0
003660 001374                 BNE     2$              ;LOOP UNTIL DONE
003662 112722 000011    1$:   MOVB    #11,(R2)+       ;LOAD 'TAB' CHAR
003666 005301                 DEC     R1
003670 100363                 BPL     3$              ;BR TO NEXT TAB COLUMN CHAR
003672 112722 000015          MOVB    #15,(R2)+       ;LOAD 'CR'
003676 112722 000012          MOVB    #12,(R2)+       ;LOAD 'LF'
003702 112722 000377          MOVB    #377,(R2)+      ;LOAD TERM
003706 000205                 RTS     R5              ;EXIT
                        ;#################################################################
                        ;*TEST 10       H       ERASE FROM CURSOR TO END OF LINE
                        ;#################################################################
003710 000004           TST10: SCOPE
003712 004537 011534          JSR     R5,AMSG         ;DISPLAY HEADING
003716 013222                 MM10

003720 004737 012474          JSR     PC,FILLMC       ;FILL BUFFER WITH A CHAR
                                                      ;DISPLAY THIS LINE
003724 004737 011354          JSR     PC,DELAY        ;DELAY

                        ;LOAD ERASE LINE TEST INTO BUFFER

003730 012700 024312    LODERL: MOV     #BUFFER,R0
003734 112720 000033          MOVB    #33,(R0)+       ;LOAD ESC
003740 112720 000110          MOVB    #'H,(R0)+       ;LOAD HOME
003744 013737 001264 004046   MOV     VHO,2$          ;LOAD COUNT
003752 005337 004046          DEC     2$
003756 112720 000033    3$:   MOVB    #33,(R0)+       ;LOAD ESC
003762 112720 000113          MOVB    #'K,(R0)+       ;LOAD ERASE LINE CHAR
003766 005337 004046          DEC     2$              ;FINISHED ?
003772 100427                 BMI     1$              ;BR WHEN DONE
003774 012737 000006 004050   MOV     #6.,10$         ;LOAD COUNT
004002 005737 001256          TST     VT5XX           ;TEST IF 12 LINES
004006 100005                 BPL     4$              ;BR IF 12 LINES
004010 006237 004050          ASR     10$             ;ADJUST HORIZ. COUNT
```

```
MAINDEC-11-DZVTC-C     MACY11 27(732)  24-AUG-76  14:41  PAGE 1-14                SEQ 0028
DZVTCC.P13     TIO     H       ERASE FROM CURSOR TO END OF LINE

 004014  000240                        NOP
 004016  000240                        NOP
 004020  000240                        NOP
 004022  112720  000033        4$:     MOVB    #33,(R0)+
 004026  112720  000103                MOVB    #'C,(R0)+       ;CURSOR RIGHT
 004032  005337  004050                DEC     10$             ;
 004036  001371                        BNE     4$              ;LOOP
 004040  112720  000012                MOVB    #12,(R0)+       ;CURSOR DOWN
 004044  000744                        BR      3$
 004046  000000        2$:     0
 004050  000000        10$:    0
 004052  112720  000377        1$:     MOVB    #377,(R0)+      ;LOAD TERM

 004056  004737  010330                JSR     PC,XPRNT        ;DISPLAY THIS TEST

 004062  004737  011354                JSR     PC,DELAY        ;TEST DELAY SWITCH

                                ;#################################################################
                                ;#TEST 11       I       ERASE FROM CURSOR TO END OF SCREEN
                                ;#################################################################
 004066  000004                TST11:  SCOPE
 004070  004537  011534                JSR     R5,AMSG         ;DISPLAY HEADING
 004074  013253                        M911
 004076  004737  012474                JSR     PC,FILLWC       ;FILL BUFFER WITH A CHAR
                                                                ;DISPLAY THIS LINE
 004102  004737  011354                JSR     PC,DELAY        ;DELAY

                                ;LOAD ERASE SCREEN TEST INTO BUFFER

 004106  013737  001316  004202  LOADER5: MOV    WIDTH,2$        ;LOAD COUNT
 004114  006237  004202                ASR     2$
 004120  012700  024312                MOV     #BUFFER,R0
 004124  112720  000010        1$:     MOVB    #10,(R0)+       ;LOAD CURSOR LEFT
 004130  005337  004202                DEC     2$              ;DONE ?
 004134  100373                        BPL     1$              ;BR UNTIL DONE
 004136  013737  001264  004202        MOV     VHD,2$          ;LOAD COUNT
 004144  112720  000033        4$:     MOVB    #33,(R0)+       ;LOAD ESC
 004150  112720  000112                MOVB    #'J,(R0)+       ;LOAD ERASE SCREEN
 004154  005337  004202                DEC     2$              ;DONE ?
 004160  100405                        BMI     3$              ;BR WHEN DONE
 004162  112720  000033                MOVB    #33,(R0)+       ;LOAD ESC
 004166  112720  000101                MOVB    #'A,(R0)+       ;LOAD CURSOR UP
 004172  000764                        BR      4$              ;LOOP
 004174  112720  000377        3$:     MOVB    #377,(R0)+      ;LOAD TERM
 004200  000401                        BR      5$
 004202  000000        2$:     0

 004204  004737  010330        5$:     JSR     PC,XPRNT        ;DISPLAY THIS TEST
 004210  004737  011354                JSR     PC,DELAY        ;TEST DELAY SWITCH

                                ;#################################################################
                                ;#TEST 12       J       VIDEO COUPLING TEST
                                ;#################################################################
 004214  000004                TST12:  SCOPE
 004216  004537  011534                JSR     R5,AMSG         ;DISPLAY HEADER
```

```
 004222  013306                            M912
 004224  013737  001266  001310            MOV     VH1,TEMP              ;LOAD COUNTER
 004232  004537  011534          1$:       JSR     R5,AMSG
 004236  016127                            PATH

 004240  005337  001310                    DEC     TEMP                  ;FINISHED COUNT ?
 004244  001372                            BNE     1$                    ;BR UNTIL DONE
 004246  004737  011354                    JSR     PC,DELAY              ;TEST DELAY SWITCH

                                 ;##############################################################
                                 ;*TEST 13        K        DIRECT CURSOR ADDRESS TEST
                                 ;##############################################################
 004252  000004                  TST13:    SCOPE
                                 ;         RANDOM NUMBERS ARE GENERATED AND USED AS "X" AND "Y" COORDINATES
                                 ;ADDRESSING A 960 CHARACTER PRINTOUT.
                                 ;VERIFICATION OF DISPLAY IS PERFORMED VISUALLY BY THE USER
                                 ;EXECUTE 1ST TIME USING "ESC-Y" SEQUENCE AND IF I.D. IS AN "H"
                                 ;         EXECUTE 2ND TIME USING "CODE 16" SEQUENCE

 004254  032737  020000  001256            BIT     #BIT13,VT5XX          ;TEST IF DCA TYPE TERMINAL
 004262  001002                            BNE     3$                    ;;BR IF CURSOR ADDRESSING
 004264  000137  005012          1$:       JMP     TST14                 ;BYPASS THIS TEST
 004270  005737  001330          3$:       TST     WFTEST                ;TEST IF IN W.F. MODE
 004274  001373                            BNE     1$                    ;BYPASS IF W.F. MODE
 004276  004537  011534                    JSR     R5,AMSG               ;ERASE SCREEN AND IDENTIFY TEST
 004302  017427                            M98
 004304  112737  000033  024312            MOVB    #33,BUFFER            ;LOAD "ESC" CODE
 004312  112737  000131  024313            MOVB    #'Y,BUFFER+1          ;LOAD ASCII "Y" (D.C.A. ENABLE)
 004320  004737  004374                    JSR     PC,DCATST             ;RUN TEST WITH ESC Y SEQUENCE
 004324  004737  011354                    JSR     PC,DELAY              ;DELAY TESTING
 004330  122737  000110  001256            CMPB    #'H,VT5XX             ;TEST IF VT50H TYPE DISPLAY
 004336  001352                            BNE     1$                    ;;BR IF NOT VT50H TYPE
 004340  004537  011534                    JSR     R5,AMSG               ;ERASE SCREEN AND IDENTIFY TEST
 004344  017427                            M98
 004346  112737  000000  024312            MOVB    #0,BUFFER             ;LOAD "SPACE" AS FIRST VALUE
 004354  112737  000016  024313            MOVB    #16,BUFFER+1          ;LOAD CODE-16 SEQUENCE
 004362  004737  004374                    JSR     PC,DCATST             ;RUN TEST WITH CODE 16 SEQUENCE
 004366  004737  011354                    JSR     PC,DELAY
 004372  000734                            BR      1$                    ;;BR TO NEXT TEST

 004374  012737  123456  024106  DCATST:   MOV     #123456,$LONUM        ;PRIME RANDOM NUMBER GENERATOR
 004402  012737  176543  024104            MOV     #176543,$HINUM
 004410  013737  001262  004666            MOV     TOTALC,OVRAL          ;LOAD CHAR COUNT
 004416  013737  001264  004664            MOV     VH0,SET               ;LOAD LINE COUNT
 004424  012700  024332                    MOV     #BUFFER+20,R0         ;LOAD DESTINATION BUFFER
 004430  012701  004670          2$:       MOV     #MSGTXT,R1            ;LOAD MESSAGE POINTER
 004434  012120                  1$:       MOV     (R1)+,(R0)+           ;LOAD 2 CHARACTERS
 004436  022701  005010                    CMP     #MSGTND,R1            ;TEST FOR LAST CHAR
 004442  001374                            BNE     1$                    ;BR UNTIL DONE 1 LINE
 004444  005337  004664                    DEC     SET                   ;FINISHED ALL LINES
 004450  001367                            BNE     2$                    ;BR IF NOT
 004452  012737  177777  024316            MOV     #-1,BUFFER+4          ;LOAD MESSAGE TERMINATOR

 004460  004737  023760          GENER:    JSR     %7,$RAND              ;GENERATE RANDOM NUMBER
 004464  013700  024106                    MOV     $LONUM,R0             ;GET RNADOM NUMBER
 004470  042700  177700                    BIC     #177700,%0            ;RANDOM NO. MUST BE TWO DIGITS
```

```
004474  020027  000037                  CMP     %0,#37          ;NO, MUST BE LESS THAN 40
004500  101767                          BLOS    GENER           ;LOWER, REGENERATION
004502  020037  001260                  CMP     %0,LASTLN               ;NO, MUST NOT BE GREATER THAN 54 OR 67
004506  101364                          BHI     GENER           ;GREATER, REGENERATION
004510  010037  004660                  MOV     %0,YADDS        ;STORE RANDOM Y COORDINATE
004514  010001                          MOV     %0,%1           ;COPY DATA
004516  012737  024332  004664          MOV     #BUFFER+20,SET  ;LOAD BASE POINTER
004524  162701  000040                  SUB     #40,%1          ;MINIMUM Y INDEX
004530  001405                          BEQ     GENRX           ;RESULT, MINIMUM Y COORDINATE
004532  062737  000120  004664  1$:     ADD     #80.,SET        ;SETUP  Y INDEX LOCATION FOR PRINTOUT
004540  005301                          DEC     %1
004542  001373                          BNE     1$              ;Y COORDINATE IS SET
004544  004737  023760          GENRX:  JSR     %7,$RAND        ;GENERATE RANDOM NUMBER
004550  013700  024106                  MOV     $LONUM,R0       ;GET A RANDOM NUMBER
004554  042700  177600                  BIC     #177600,%0      ;RANDOM NO. MAY BE LESS THAN 200
004560  020027  000037                  CMP     %0,#37          ; MUST NOT BE LESS THAN 40
004564  101767                          BLOS    GENRX           ;LOWER, REGENERATION
004566  020027  000157                  CMP     %0,#157         ; MUST NOT BE GREATER THAN 157
004572  101364                          BHI     GENRX           ;GREATER, REGENERATION
004574  010037  004662                  MOV     %0,XADDS        ;STORE RANDOM X COORDINATE
004600  162700  000040                  SUB     #40,%0          ;SETUP MINIMUM X INDEX
004604  060037  004664                  ADD     %0,SET          ;SETUP X COOR. FOR PNTOUT.
004610  013701  004664                  MOV     SET,%1          ;SETUP CHECK
004614  105711                          TSTB    (1)             ;HAS CURRENT CHAR. ALREADY BEEN USED?
004616  100720                          BMI     GENER           ;YES, REGENERATE
004620  113737  004660  024314          MOVB    YADDS,BUFFER+2  ;LOAD Y COORDINATE
004626  113737  004662  024315          MOVB    XADDS,BUFFER+3  ;LOAD X COORDINATE
004634  111137  024316                  MOVB    (1),BUFFER+4    ;LOAD CHARACTER TO BE PRINTED
004640  152711  000200                  BISB    #200,(1)        ;INDICATE USE OF CURSOR POSITION
004644  004737  010330                  JSR     PC,XPRNT        ;EXECUTE AND PRINT CHARACTER
004650  005337  004666                  DEC     OVRAL           ;MAXIMUM NO. OF COORDINATES
004654  001301                          BNE     GENER           ;BR BACK UNTIL DONE
004656  000207                          RTS     PC              ;EXIT

004660  000000                  YADDS:  0
004662  000000                  XADDS:  0
004664  000000                  SET:    0
004666  000000                  OVRAL:  0
004670  052126  030065  050055  MSGTXT: .ASCII  \VT50-PLUS-DIRECT-CURSOR-ADDRESSING-TEST\
004676  052514  026523  044504
004704  042522  052103  041455
004712  051125  047523  026522
004720  042101  051104  051505
004726  044523  043516  052055
004734  051505     124
004737     055  044504  044507          .ASCII  \-DIGITAL-EQUIPMENT-CORP.-MAYNARD-MA.-VT50\
004744  040524  026514  050505
004752  044525  046520  047105
004760  026524  047503  050122
004766  026456  040515  047131
004774  051101  026504  040515
005002  026456  052126  030065
005010  100000                  MSGTND: BIT15
                                ;ONLY 12 LINE TERMINALS WILL RUN THIS TEST
                                ;*******************************************************
(3)                             ;*TEST 14       L       HOLD SCREEN TEST
```

```
(3)                                     ;*****************************************************************
(2)  005012  000004                     TST14:  SCOPE
     005014  005037  010750                     CLR     AXOFF
     005020  005037  010752                     CLR     XOFFRC          ;CLEAR SOFT FLAG
     005024  004537  011534                     JSR     R5,AMSG         ;DISPLAY
     005030  016101                             CRLF
     005032  004537  011534                     JSR     R5,AMSG         ;CR-LF
     005036  016101                             CRLF
                                        
     005040  005737  001330                     TST     WFTEST          ;TEST IF IN W.F. MODE
     005044  001046                             BNE     TST15           ;;BR IF W.F. MODE
     005046  005737  001256                     TST     VTSXX           ;TEST IF 12 LINE
     005052  100443                             BMI     TST15           ;;BR IF NOT 12 LINE
     005054  004537  011534                     JSR     R5,AMSG         ;DISPLAY MESSAGE
     005060  013473                             M422
                                        
     005062  012737  000001  010746             MOV     #1,XOFFOK
     005070  012737  000001  010744             MOV     #1,XOFFBR       ;ENABLE XOFF
     005076  004537  011534                     JSR     R5,AMSG         ;TRY TO  SCROLL THE SCREEN
     005102  017317                             GOHDSC                  ;ENABLE HOLD SCREEN
                                        
     005104  005737  010752                     TST     XOFFRC          ;TEST IF XOFF SENSED
     005110  001001                             BNE     1$              ;BR IF SENSED
                                        
     005112  104002                             ERROR   2               ;ENABLE HOLD SCREEN MODE FAILED TO
                                                                         ;INHIBIT THE SCREEN FROM SCROLLING
                                                                         ;BY SENDING "X-OFF"
                                        
     005114  005037  010754             1$:     CLR     XONRC           ;CLEAR SOFT FLAG
     005120  005037  010744                     CLR     XOFFBR
     005124  012737  000001  010750             MOV     #1,AXOFF
     005132  004537  011534                     JSR     R5,AMSG
     005136  017345                             GODSHS                  ;DISABLE HOLD SCREEN MODE
                                        
     005140  004537  011534                     JSR     R5,AMSG
     005144  016112                             CRLFA                   ;TRY SCROLLING THE SCREEN
                                        
     005146  005737  010754                     TST     XONRC           ;TEST SOFT FLAG (X-ON)
     005152  001001                             BNE     2$              ;BR IF SENSED
                                        
     005154  104002                             ERROR   2               ;DISABLE HOLD SCREEN MODE FAILED TO ENABLE
                                                                         ;THE SCREEN TO SCROLL BY SENDING AN "X-ON"
                                        
     005156  004737  011354             2$:     JSR     PC,DELAY        ;PROGRAM DELAY
                                        
                                        ;*****************************************************************
(3)                                     ;*TEST 15       M       TEST GRAPHICS MODE AND REV. LINE FEED
(3)                                     ;*****************************************************************
(2)  005162  000004                     TST15:  SCOPE
     005164  032737  001000  001256             BIT     #BIT09,VTSXX    ;IS UNIT VTS2?
     005172  001002                             BNE     GRPHST          ;YES-TEST GRAPHICS AND REV. LINE FEED
     005174  000137  005274                     JMP     COPTST          ;NO-GO CHECK FOR COPIER
     005200  012704  000120             GRPHST: MOV     #80.,R4
     005204  004537  011534             1$:     JSR     R5,AMSG         ;HOME THE CURSOR AND CLEAR THE SCREEN.
     005210  016121                             HOMERS
     005212  004537  011534                     JSR     R5,AMSG         ;DISPLAY TEST MESSAGE
```

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                                        M9221
005216 013530                           JSR     R5,AMSG         ;ENTER GRAPHICS MODE.
005220 004537 011534                    ENGRAF
005224 021075
005226 012737 000045 001312             MOV     #37.,TEMPO      ;SET UP TO XMIT 80 LINES
005234 004737 011312            2$:     JSR     PC,GBBUF        ;LOAD BUFFER WITH GRAPHICS
005240 004737 010330                    JSR     PC,XPRNT        ;DISPLAY 1 LINE
005244 004537 011534                    JSR     R5,AMSG         ;ISSUE REV. LINE FEED AND
005250 021056                           REVLF                   ;A CARRIAGE RETURN
005252 005304                           DEC     R4              ;DECREMENT BUFFER COUNT
005254 005337 001312            3$:     DEC     TEMPO           ;DONE?
005260 001365                           BNE     2$              ;NO-LOOP
005262 004537 011534                    JSR     R5,AMSG         ;YES-EXIT GRAPHICS MODE
005266 021102                           EXGRAF
005270 004737 011354                    JSR     PC,DELAY        ;AND GO CHECK DELAY
005274                          COPTST:
                                ;*******************************************************
                                ;*TEST 16       M       COPIER - AUTO COPY TEST
                                ;*******************************************************
005274 000004                   TST16:  SCOPE
005276 032737 040000 001256             BIT     #BIT14,VTSXX    ;TEST IF COPIER IS AVAILABLE
005304 001002                           BNE     2$              ;;BR IF AVAILABLE
005306 000137 006254            3$:     JMP     PRNTST          ;NOT AVAILABLE SO BYPASS COPIER TESTS
005312 032777 004000 173560     2$:     BIT     #BIT11,@SWR     ;TEST IF INHIBIT COPIER TEST SWITCH IS SET
005320 001372                           BNE     3$              ;BR IF SET
005322 032777 002000 173550             BIT     #BIT10,@SWR     ;TEST IF PAPER SAVE SWITCH IS SET
005330 001406                           BEQ     6$              ;BR IF NOT SET AND START COPIER TESTING
005332 105737 001272                    TSTB    PRTCNT          ;TEST IF TIME TO TEST COPIER
005336 001363                           BNE     3$              ;NOT TIME TO RUN THE COPIER
005340 013737 001246 001272             MOV     PTCT,PRTCNT     ;RELOAD COUNTER AND TEST COPIER

005346 004537 011534            6$:     JSR     R5,AMSG
005352 013605                           M923                    ;DISPLAY HEADER
005354 004537 011534                    JSR     R5,AMSG         ;ENABLE AUTO-COPY
005360 017373                           COAPMD

005362 013737 001264 001312             MOV     VHD,TEMPO       ;LOAD A EXECUTION COUNT
005370 012701 000101                    MOV     #101,R1         ;LOAD A CHARACTER
005374 004737 010226                    JSR     PC,FILBUF       ;LOAD CHARACTER INTO BUFFER
005400 012737 000001 010746     1$:     MOV     #1,XOFFOK
005406 004737 010330                    JSR     PC,XPRNT        ;DISPLAY IT
005412 004737 011354                    JSR     PC,DELAY        ;PROGRAM DELAY
005416 005337 001312                    DEC     TEMPO           ;FINISHED ?
005422 100366                           BPL     1$              ;BR IF NOT
005424 012737 000001 010746             MOV     #1,XOFFOK
005432 004537 011534                    JSR     R5,AMSG         ;DISABLE AUTO-COPY
005436 017400                           GONAPM
005440 004737 011354                    JSR     PC,DELAY        ;ANOTHER DELAY

                                ;*******************************************************
                                ;*TEST 17       0       COPIER - FULL SCREEN OF A CHARACTER
                                ;*******************************************************
005444 000004                   TST17:  SCOPE
005446 004537 011534            1$:     JSR     R5,AMSG         ;DISPLAY HEADER
005452 012731                           M91
005454 004737 012474                    JSR     PC,FILLWC       ;FILL BUFFER WITH CHAR
                                                                ;DISPLAY IT
```

```
                                012737  000001  010746          MOV     #1,XOFFOK       ;ALLOW XOFF
                                004537  011534                  JSR     R5,AMSG         ;COPY INST
                                017271                          COPRNT
                                004737  011354                  JSR     PC,DELAY
                                
                                
                                
                                ;*************************************************************
                                ;*TEST 20       P       COPIER - DATA PATH TEST
                                ;*************************************************************
                        005500  000004          TST20:  SCOPE
                                004537  011534                  JSR     R5,AMSG         ;DISPLAY HEADING
                                012777                          M92
                                013737  001266  001310          MOV     VH1,TEMP        ;SET-UP A COUNTER
                                004537  011246                  JSR     R5,DTPSR        ;SET-UP BUFFER
                                000077                          77                      ;OCTAL '?'
                                000100                          100                     ;OCTAL '@'
                                004537  011252                  JSR     R5,DTPSR8       ;SET-UP BUFFER
                                000125                          125                     ;OCTAL 'U'
                                000052                          52                      ;OCTAL '*'
                                004737  010330          1$:     JSR     PC,XPRNT        ;DISPLAY THIS LINE
                                005337  001310                  DEC     TEMP            ;COMPLETED FULL COUNT?
                                001373                          BNE     1$              ;BRANCH IF NOT COMPLETED
                                012737  000001  010746          MOV     #1,XOFFOK
                                004537  011534                  JSR     R5,AMSG
                                017271                          COPRNT                  ;COPY INST
                                004737  011354                  JSR     PC,DELAY        ;TEST DELAY SWITCH
                                
                                ;*************************************************************
                                ;*TEST 21       Q       COPIER - SINGLE CHARACTER ACROSS ALL COLS. <ALL CHARACTERS>
                                ;*************************************************************
                        005570  000004          TST21:  SCOPE
                                004537  011534                  JSR     R5,AMSG         ;DISPLAY HEADING
                                013026                          M93
                                012737  000040  001304          MOV     #40,STCHAR      ;SET-UP STARTING CHARACTER
                                013737  001264  001312          MOV     VH0,TEMPO
                                013701  001304          1$:     MOV     STCHAR,R1       ;LOAD R1= TO CHARACTER
                                004737  010226                  JSR     PC,FILBUF       ;LOAD A BUFFER WITH THAT CHARACTER
                                004737  010330                  JSR     PC,XPRNT        ;DISPLAY A FULL LINE FROM THE BUFFER
                                005337  001264                  DEC     TEMPO           ;DONE
                                001011                          BNE     3$
                                013737  001264  001312          MOV     VH0,TEMPO
                                012737  000001  010746          MOV     #1,XOFFOK       ;ALLOW XOFF
                                004537  011534                  JSR     R5,AMSG
                                017271                          COPRNT                  ;COPY INST
                                005237  001304          3$:     INC     STCHAR          ;UPDATE THE CHARACTER
                                023737  001306  001304          CMP     LASTCH,STCHAR   ;TEST FOR FINAL CHARACTER
                                001350                          BNE     1$              ;BRANCH IF NOT COMPLETED
                                004537  011534                  JSR     R5,AMSG         ;CRLF
                                016110                          CRLFA-2
                                012737  000001  010746          MOV     #1,XOFFOK       ;ENABLE XOFF
                                004537  011534                  JSR     R5,AMSG         ;COPY INS
                                017271                          COPRNT
                                004737  011354                  JSR     PC,DELAY        ;TEST DELAY SWITCH
                                
                                ;*************************************************************
                                ;*TEST 22       R       COPIER - ROTATING CHARACTERS ACROSS ALL COLS. <ALL CHARACTERS>
```

```
(3)                                      ;*********************************************************
(2)  005722  000004                      TST22:  SCOPE
     005724  004537  011534                      JSR     R5,AMSG         ;DISPLAY HEADING
     005730  013070                              M94
     005732  012737  000040  001304              MOV     #40,STCHAR      ;SET-UP STARTING CHARACTER
     005740  013737  001264  001312              MOV     VHO,TEMPO       ;
     005746  013701  001304              1$:     MOV     STCHAR,R1       ;LOAD R1=TO CHARACTER
     005752  004537  010262                      JSR     R5,LIC          ;LOAD A BUFFER STARTING WITH
     005756  001316                              WIDTH                   ; THAT CHARACTER AND WIDTH <BYTE>
     005760  004737  010330                      JSR     PC,XPRNT        ;DISPLAY A FULL LINE FROM THE BUFFER
     005764  005337  001312                      DEC     TEMPO           ;DONE ?
     005770  001011                              BNE     3$
     005772  013737  001264  001312              MOV     VHO,TEMPO
     006000  012737  000001  010746              MOV     #1,XOFFOK
     006006  004537  011534                      JSR     R5,AMSG
     006012  017271                              GOPRNT                  ;COPY INST
     006014  005237  001304              3$:     INC     STCHAR          ;UPDATE THE STARTING CHARACTER
     006020  023737  001306  001304              CMP     LASTCH,STCHAR   ;TEST FOR FINAL CHARACTER
     006026  001347                              BNE     1$              ;BRANCH IF NOT COMPLETED
     006030  004537  011534                      JSR     R5,AMSG         ;CRLF
     006034  016110                              CRLFA-2
     006036  012737  000001  010746              MOV     #1,XOFFOK       ;ENABLE XOFF
     006044  004537  011534                      JSR     R5,AMSG         ;COPY INST
     006050  017271                              GOPRNT
     006052  004737  011354                      JSR     PC,DELAY        ;TEST DELAY SWITCH

                                         ;*********************************************************
(3)                                      ;*TEST 23         S       COPIER - PERIMETER PATTERN
(3)                                      ;*********************************************************
(2)  006056  000004                      TST23:  SCOPE
     006060  004537  011534                      JSR     R5,AMSG         ;DISPLAY HEADER
     006064  013407                              M920
     006066  012701  000105                      MOV     #'E,R1          ;LOAD STARTING CHARACTER
     006072  004737  010226                      JSR     PC,FILBUF       ;FILL THE BUFFER
     006076  004737  010330                      JSR     PC,XPRNT        ;DISPLAY A LINE
     006102  004737  010330                      JSR     PC,XPRNT        ;DISPLAY A LINE
     006106  013737  001266  001310              MOV     VH1,TEMP        ;LOAD VERT COUNT
     006114  062737  000002  001310              ADD     #2,TEMP         ;UPDATE BY 2
     006122  004737  011152              1$:     JSR     PC,FIRLST       ;FILL FIRST AND LAST
     006126  004737  010330                      JSR     PC,XPRNT        ;DISPLAY A LINE
     006132  005337  001310                      DEC     TEMP            ;DONE ?
     006136  001371                              BNE     1$
     006140  012701  000105                      MOV     #'E,R1          ;LOAD STARTING CHAR
     006144  004737  010226                      JSR     PC,FILBUF       ;LOAD LINE WITH E'S
     006150  004737  010330                      JSR     PC,XPRNT        ;DISPLAY A LINE
     006154  004737  010330                      JSR     PC,XPRNT
     006160  012737  000001  010746              MOV     #1,XOFFOK
     006166  004537  011534                      JSR     R5,AMSG
     006172  017271                              GOPRNT                  ;COPY SCREEN
     006174  004737  011354                      JSR     PC,DELAY

                                         ;*********************************************************
(3)                                      ;*TEST 24         T       COPIER - DISCLAIMER STATEMENT
(3)                                      ;*********************************************************
(2)  006200  000004                      TST24:  SCOPE
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MAINDEC-11-DZVTC-C     MACY11 27(732)  24-AUG-76  14:41  PAGE 1-21                SEQ 0035
DZVTCC.P13     T24     T       COPIER - DISCLAIMER STATEMENT

  878  006202 004537 011534            JSR     R5,AMSG         ;DISPLAY HEADER
  879  006206 013437                    M921
  880
  881  006210 005004                    CLR     R4
  882  006212 016437 006530 006226 1$:  MOV     DISPCH(R4),10$  ;LOAD A POINTER
  883  006220 001405                    BEQ     2$              ;BR IF DONE
  884  006222 004537 011534            JSR     R5,AMSG         ;DISPLAY COPYRIGHT
  885  006226 021362                10$: MTEXTO
  886  006230 005724                    TST     (R4)+           ;UPDATE POINTER
  887  006232 000767                    BR      1$
  888
  889
  890  006234 012737 000001 010746 2$:  MOV     #1,XOFFOK       ;ENABLE XOFF
  891  006242 004537 011534            JSR     R5,AMSG         ;COPY SCREEN
  892  006246 017271                    GOPRNT
  893  006250 004737 011354            JSR     PC,DELAY
  894  006254 000240                PRNTST: NOP                 ;TRY PRINTER TESTS
  895
  896                                   ;*****************************************************************
(3)                                     ;*TEST 25       U       PRINTER CONTROLLER MODE TEST
(3)                                     ;*****************************************************************
(2) 006256 000004                    TST25: SCOPE
  897  006260 032737 002000 001256            BIT     #BIT10,VTSXX    ;IS UNIT EQUIPPED WITH PRINTER.
  898  006266 001002                          BNE     1$              ;YES-TEST IT
  899  006270 000137 006556                   JMP     SEOP            ;NO-EXIT TEST
  900  006274 004537 011534            1$:    JSR     R5,AMSG         ;DISPLAY HEADER
  901  006300 013644                          MPTCNT
  902  006302 004537 011534                  JSR     R5,AMSG         ;ENABLE PRINTER CONTROLLER MODE.
  903  006306 021107                          ENPNTM
  904  006310 012737 000040 001304           MOV     #40,STCHAR      ;LOAD INITIAL CHAR.
  905  006316 013701 001304            2$:    MOV     STCHAR,R1
  906  006322 004537 010262                  JSR     R5,LIC          ;BUILD A 132 COL. LINE.
  907  006326 001314                          PNTWID
  908  006330 012737 000001 010746           MOV     #1,XOFFOK       ;ALLOW XOFF/XON PROTOCOL
  909  006336 004737 010330                  JSR     PC,XPRNT        ;DISPLAY IT.
  910  006342 005237 001304                  INC     STCHAR          ;INCREMENT 1ST CHAR.
  911  006346 023737 001304 001306           CMP     STCHAR,LASTCH   ;ISSUED 92 LINES?
  912  006354 001360                          BNE     2$              ;NO-LOOP
  913  006356 004537 011534                  JSR     R5,AMSG         ;YES-DISABLE PRINTER
  914  006362 021114                          EXPNTM                  ;CONTROLLER MODE.
  915  006364 004737 011354                  JSR     PC,DELAY        ;TEST DELAY SWITCH AND EXIT.
  916
  917                                   ;*****************************************************************
(3)                                     ;*TEST 26       V       PRINT SCREEN TEST
(3)                                     ;*****************************************************************
(2) 006370 000004                    TST26: SCOPE
  918
  919
  920  006372 004537 011534            JSR     R5,AMSG         ;DISPLAY PRINT SCREEN MESSAGE
  921  006376 013713                    MPTSCN
  922
  923  006400 004737 012474            JSR     PC,FILLWC       ;FILL THE SCREEN WITH E
  924
  925  006404 012737 000001 010746      MOV     #1,XOFFOK       ;ALLOW XOFF/XON PROTOCOL
  926  006412 004537 011534            JSR     R5,AMSG         ;PRINT THEM
  927  006416 017271                    GOPRNT
```

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006420  004737  011354                          JSR     PC,DELAY        ;TEST DELAY SWITCH.

                                        ;*****************************************************************
                                        ;*TEST 27          W        AUTO PRINT TEST
                                        ;*****************************************************************
006424  000004                          TST27:  SCOPE

006426  004537  011534                          JSR     R5,AMSG
006432  013750                                  M923A                   ;DISPLAY HEADER
006434  004537  011534                          JSR     R5,AMSG         ;ENABLE AUTO-PRINT
006440  017373                                  GOAPMD

006442  013737  001264  001312                  MOV     VHD,TEMPO       ;LOAD A EXECUTION COUNT
006450  012701  000101                          MOV     #101,R1         ;LOAD A CHARACTER
006454  004737  010226                          JSR     PC,FILBUF       ;LOAD CHARACTER INTO BUFFER
006460  012737  000001  010746  1$:             MOV     #1,XOFFOK
006466  004737  010330                          JSR     PC,XPRNT        ;DISPLAY IT
006472  004737  011354                          JSR     PC,DELAY        ;PROGRAM DELAY
006476  005337  001312                          DEC     TEMPO           ;FINISHED ?
006502  100366                                  BPL     1$              ;BR IF NOT
006504  012737  000001  010746                  MOV     #1,XOFFOK
006512  004537  011534                          JSR     R5,AMSG         ;DISABLE AUTO-PRINT
006516  017400                                  GONAPM
006520  004737  011354                          JSR     PC,DELAY        ;ANOTHER DELAY

006524  000137  006556                          JMP     $EOP            ;END OF PASS
006530  021352                          DISPCH: MTEXT0
006532  021456                                  MTEXT1
006534  021557                                  MTEXT2
006536  021661                                  MTEXT3
006540  021744                                  MTEXT4
006542  022046                                  MTEXT5
006544  022147                                  MTEXT6
006546  022201                                  MTEXT7
006550  022301                                  MTEXT8
006552  000000                                  0
006554  000000                                  0

                                        ;*****************************************************************

                                        .SBTTL  END OF PASS ROUTINE

                                        ;*INCREMENT THE PASS NUMBER ($PASS)
                                        ;*INDICATE END-OF-PROGRAM AFTER 1 PASSES THRU THE PROGRAM
                                        ;*TYPE "END PASS #XXXXX" (WHERE XXXXX IS A DECIMAL NUMBER)
                                        ;*IF THERES A MONITOR GO TO IT
                                        ;*IF THERE ISN'T JUMP TO NOWEOP

006556                                  $EOP:
006556  000004                                  SCOPE
006560  005737  001242                          TST     LAST                    ;TEST IF MORE
006564  001414                                  BEQ     1$                      ;BR IF NONE
006566  023737  001242  001244                  CMP     LAST,VTNOW              ;IS THIS THE LAST ONE
006574  001410                                  BEQ     1$                      ;BR IF YES
006576  062737  000010  001244                  ADD     #10,VTNOW
```

```
(3)  006604  012737  001760  001756          MOV     #TST1,WHERE
(3)  006612  000137  001724                  JMP     RSTRT                   ;TEST NEXT ONE
(3)  006616  005737  001104          1$:     TST     $PASS                   ;TEST IF FIRST PASS
(3)  006622  001002                          BNE     2$                      ;BR IF NOT
(3)  006624  104400  017617                  TYPE    ,PASHED                 ;TYPE EOP HEADER
(3)  006630  000005                  2$:     RESET
(3)  006632  005737  001330                  TST     WFTEST          ;TEST IF W.F. MODE
(3)  006636  001402                          BEQ     3$              ;BR IF NOT
(3)  006640  004737  011462                  JSR     PC,ADELAY       ;EXTRA DELAY
(3)  006644  000240                  3$:     NOP
(3)
(1)  006646  005037  001106                  CLR     $TSTNM          ;;ZERO THE TEST NUMBER
(1)  006652  005237  001104                  INC     $PASS           ;;INCREMENT THE PASS NUMBER
(1)  006656  042737  100000  001104          BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
(1)  006664  005327                          DEC     (PC)+           ;;LOOP?
(1)  006666  000001                  $EOPCT: .WORD   1
(1)  006670  003022                          BGT     $DOAGN          ;;YES
(1)  006672  012737                          MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
(1)  006674  000001                  $ENDCT: .WORD   1
(1)  006676  006666                          $EOPCT
(1)  006700  104400  006742                  TYPE    ,$ENDMG         ;;TYPE "END PASS #"
(2)  006704  013746  001104                  MOV     $PASS,-(SP)     ;;SAVE $PASS FOR TYPEOUT
(2)  006710  104404                          TYPOS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
(1)  006712  104400  006757                  TYPE    ,$ENULL         ;;TYPE A NULL CHARACTER
(1)  006716                          $GET42:
(1)
(1)  006716  013700  000042                  MOV     @#42,R0         ;;GET MONITOR ADDRESS
(1)  006722  001405                          BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
(1)  006724  000005                          RESET                   ;;CLEAR THE WORLD
(1)  006726  004710                  $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
(1)  006730  000240                          NOP                     ;;SAVE ROOM
(1)  006732  000240                          NOP                     ;;FOR
(1)  006734  000240                          NOP                     ;;ACT11
(1)  006736                          $DOAGN:
(1)  006736  000137  006762                  JMP     @#NOWEOP                ;;RETURN
(1)  006742  005015  047105  020104  $ENDMG: .ASCIZ  <15><12>/END PASS #/
(1)  006750  040520  051523  021440
(1)  006756       000
(1)  006757       377        377     000  $ENULL: .BYTE   -1,-1,0         ;;NULL CHARACTER STRING
984  006762  005737  001272          NOWEOP: TST     PRTCNT
985  006766  100002                          BPL     11$
986  006770  105337  001272                  DECB    PRTCNT
987  006774  012737  001760  001756  11$:    MOV     #TST1,WHERE
988  007002  013746  001116                  MOV     $ERTTL,-(SP)
989  007006  104404                          TYPOS
990  007010  104400  006757                  TYPE    ,$ENULL
991  007014  000137  001716                  JMP     $BEGIN
992                                  ;*****************************************************************
(3)                                  ;*TEST 30        X       KEYBOARD OCTAL VALUE LOOP
(3)                                  ;*****************************************************************
(2)  007020  000004                  TST30:  SCOPE
996  007022  012706  001100          KRBEC0: MOV     #STACK,SP
997  007026  004537  011534                  JSR     R5,AMSG                 ;DISPLAY HEADER
998  007032  015620                          MKE
999  007034  004737  012536          1$:     JSR     PC,GETCHR               ;GET CHAR
1000 007040  000775                          BR      1$              ;;BR BACK IF NO INPUT
```

```
 1001  007042  004737  011554                JSR     PC,OCTAL        ;CONVERT R0 TO OCTAL
 1002  007046  113737  011644  016043        MOVB    DIG0,MKEB       ;LOAD DIGIT
 1003  007054  113737  011646  016044        MOVB    DIG1,MKEB+1     ;LOAD DIGIT
 1004  007062  113737  011650  016045        MOVB    DIG2,MKEB+2     ;LOAD DIGIT
 1005  007070  042700  177600                BIC     #177600,R0
 1006  007074  001001                        BNE     10$
 1007  007076  005200                        INC     R0
 1008  007100  012701  007210        10$:    MOV     #BFCHR,R1       ;LOAD POINTER
 1009  007104  121100                5$:     CMPB    (R1),R0         ;TEST IF = TO VALUE IN TABLE ?
 1010  007106  001403                        BEQ     3$              ;BR IF FOUND
 1011  007110  005721                        TST     (R1)+           ;MOVE POINTER
 1012  007112  001374                        BNE     5$              ;BR IF MORE
 1013  007114  000407                        BR      2$              ;BR IF NOT IN LIST
 1014  007116  062701  000040        3$:     ADD     #BFCHAR-BFCHR,R1 ;UPDATE POINTER
 1015  007122  112137  016036                MOVB    (R1)+,MKEA1     ;LOAD 1ST CHAR
 1016  007126  112137  016037                MOVB    (R1)+,MKEA1+1   ;LOAD 2ND
 1017  007132  000420                        BR      4$
 1018  007134  120027  000040        2$:     CMPB    R0,#40          ;TEST IF LESS THAN 40
 1019  007140  101010                        BHI     6$              ;BR IF ABOVE
 1020  007142  062700  000100                ADD     #100,R0         ;MAKE PRINTABLE
 1021  007146  110037  016037                MOVB    R0,MKEA1+1      ;SAVE CHAR
 1022  007152  112737  000136  016036        MOVB    #136,MKEA1      ;ADD A '↑' BEFORE CHARACTER
 1023  007160  000405                        BR      4$
 1024  007162  112737  000040  016037  6$:   MOVB    #40,MKEA1+1     ;LOAD SPACE
 1025  007170  110037  016036                MOVB    R0,MKEA1        ;LOAD CHARACTER
 1026  007174  005237  010760        4$:     INC     IGNORE          ;IGNORE DOUBLE CHARACTER FLAG
 1027  007200  004537  011534                JSR     R5,AMSG         ;DISPLAY MESSAGE
 1028  007204  016025                        MKEA
 1029  007206  000712                        BR      1$              ;LOOP BACK
 1030
 1031                                  ;TABLE OF DEFINED CHARACTERS
 1032
 1033  007210  000007                BFCHR:  7                       ;BELL CODE
 1034  007212  000010                        10                      ;CURSOR LEFT CODE
 1035  007214  000011                        11                      ;TAB CODE
 1036  007216  000012                        12                      ;LINE FEED CODE
 1037  007220  000015                        15                      ;CARRIAGE RETURN CODE
 1038  007222  000033                        33                      ;ESCAPE CODE
 1039  007224  000040                        40                      ;SPACE CODE
 1040  007226  000177                        177                     ;DELETE CODE
 1041  007230  000000                        0
 1042  007232  000000                        0
 1043  007234  000000                        0
 1044  007236  000000                        0
 1045  007240  000000                        0
 1046  007242  000000                        0
 1047  007244  000000                        0
 1048  007246  000000                        0
 1049
 1050                                  ;DEFINED CHARACTER EQUIL
 1051
 1052  007250  046102                BFCHAR: .ASCII  /BL/             ;BELL
 1053  007252  046103                        .ASCII  /CL/            ;CURSOR LEFT
 1054  007254  052110                        .ASCII  /HT/            ;H TAB
 1055  007256  043114                        .ASCII  /LF/            ;LINE FEED
 1056  007260  051103                        .ASCII  /CR/            ;CARIAGE RETURN
```

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MAINDEC-11-DZVTC-C     MACY11 27(732)  24-AUG-76  14:41  PAGE 1-25                    SEQ 0039
DZVTCC.P13      T30    X       KEYBOARD OCTAL VALUE LOOP

 1057  007262  051505                        .ASCII  /ES/                    ;ESCAPE
 1058  007264  050123                        .ASCII  /SP/                    ;SPACE
 1059  007266  042504                        .ASCII  /DE/                    ;DELETE
 1060  007270  000000  000000  000000        0,0,0,0,0,0,0,0,0,0
       007276  000000  000000  000000
       007304  000000  000000  000000
       007312  000000
 1061                                        .EVEN
 1062                                ;#################################################################
  (3)                                ;*TEST 31       Y       KEYBOARD CHARACTER TEST
  (3)                                ;#################################################################
  (2)  007314  000004                TST31:  SCOPE
 1063  007316  032737  001000  001256 KRBTST: BIT     #BIT09,VT5XX    ;IS UNIT A VT52?
 1064  007324  001403                        BEQ     1$
 1065  007326  012703  020332                MOV     #VS2RW,R3       ;YES-SET UP FOR LOWER CASE CHAR.
 1066  007332  000402                        BR      2$
 1067  007334  012703  020314        1$:     MOV     #VSORW,R3       ;NO-SET UP FOR UPPER CASE CHAR.
 1068  007340  012706  001100        2$:     MOV     #STACK,SP
 1069  007344  004537  011534        A:      JSR     R5,AMSG         ;DISPLAY HEADER
 1070  007350  014005                        MKB
 1071  007352  012302                        MOV     (R3)+,R2        ;LOAD ROW #
 1072  007354  032737  001000  001256        BIT     #BIT09,VT5XX    ;UNIT A VT52?
 1073  007362  001404                        BEQ     1$              ;NO-USE UPPER CASE KEYBOARD.
 1074  007364  004537  011534                JSR     R5,AMSG         ;ISSUE VT52 ROW1 MESSAGE.
 1075  007370  014300                        MKBB2
 1076  007372  000403                        BR      2$
 1077  007374  004537  011534        1$:     JSR     R5,AMSG
 1078  007400  014163                        MKBB                    ;TOP ROW
 1079  007402  004737  011652        2$:     JSR     PC,TSTROW       ;CHECK THE ROW
 1080
 1081  007406  012302                B:      MOV     (R3)+,R2        ;LOAD ROW #
 1082  007410  004537  011534                JSR     R5,AMSG         ;2ND ROW
 1083  007414  014363                        MKBC
 1084  007416  004737  011652                JSR     PC,TSTROW       ;CHECK 2ND ROW
 1085
 1086  007422  012302                C:      MOV     (R3)+,R2        ;LOAD ROW #
 1087  007424  032737  001000  001256        BIT     #BIT09,VT5XX    ;UNIT A VT52?
 1088  007432  001404                        BEQ     1$              ;NO-USE UPPER CASE KEYBOARD.
 1089  007434  004537  011534                JSR     R5,AMSG         ;ISSUE VT52 ROW 3 MESSAGE.
 1090  007440  014527                        MKBD2
 1091  007442  000403                        BR      2$
 1092  007444  004537  011534        1$:     JSR     R5,AMSG
 1093  007450  014422                        MKBD
 1094  007452  004737  011652        2$:     JSR     PC,TSTROW       ;CHECK ROW 3
 1095
 1096  007456  012302                        MOV     (R3)+,R2        ;LOAD ROW #
 1097  007460  004537  011534                JSR     R5,AMSG
 1098  007464  014615                        MKBE
 1099  007466  004737  011652                JSR     PC,TSTROW       ;CHECK ROW 4
 1100
 1101  007472  012702  020516                MOV     #ROW5,R2
 1102  007476  004537  011534                JSR     R5,AMSG
 1103  007502  014736                        MKBF
 1104  007504  004737  011652                JSR     PC,TSTROW       ;CHECK ROW 5
 1105
 1106                                ;TEST THE "LEFT"-SHIFT KEY
```

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1107
1108  007510 004537 011534          D:      JSR     R5,AMSG         ;DEPRESS THE "LEFT-SHIFT" KEY
1109  007514 014773                         MKBG
1110  007516 012302                         MOV     (R3)+,R2        ;LOAD ROW 1 SHIFTED TABLE
1111  007520 032737 001000 001256           BIT     #BIT09,VT5XX    ;UNIT A VT52?
1112  007526 001404                         BEQ     1$              ;NO-USE UPPER CASE KEYBOARD.
1113  007530 004537 011534                  JSR     R5,AMSG         ;ISSUE VT52 ROW1 MESSAGE.
1114  007534 014300                         MKBB2
1115  007536 000403                         BR      2$
1116  007540 004537 011534          1$:     JSR     R5,AMSG         ;TEST ROW 1
1117  007544 014163                         MKBC
1118  007546 004737 011652          2$:     JSR     PC,TSTROW       ;TEST THE ROW
1119  007552 004537 011534                  JSR     R5,AMSG         ;RELEASE THE SHIFT KEY
1120  007556 014041                         MKB1
1121
1122                                 ;TEST THE "RIGHT-SHIFT" KEY
1123
1124  007560 004537 011534          E:      JSR     R5,AMSG         ;SET THE "RIGHT-SHIFT" KEY
1125  007564 015046                         MKBGA
1126  007566 012302                         MOV     (R3)+,R2        ;LOAD TABLE POINTER
1127  007570 032737 001000 001256           BIT     #BIT09,VT5XX    ;UNIT A VT52?
1128  007576 001404                         BEQ     1$              ;NO-USE UPPER CASE KEYBOARD.
1129  007600 004537 011534                  JSR     R5,AMSG         ;ISSUE VT52 ROW1 MESSAGE.
1130  007604 014300                         MKBB2
1131  007606 000403                         BR      2$
1132  007610 004537 011534          1$:     JSR     R5,AMSG
1133  007614 014163                         MKBB
1134  007616 004737 011652          2$:     JSR     PC,TSTROW       ;TEST THE ROW AGAIN WITH THE RIGHT-SHIFT SET
1135  007622 004537 011534                  JSR     R5,AMSG
1136  007626 014041                         MKB1                    ;RELEASE SKIFT KEY
1137                                 ;TEST THE CONTROL MODE
1138
1139  007630 004537 011534          F:      JSR     R5,AMSG         ;SET CTRL
1140  007634 015112                         MKBH
1141  007636 012302                         MOV     (R3)+,R2        ;LOAD ROW 1 CTRL TABLE
1142  007640 032737 001000 001256           BIT     #BIT09,VT5XX    ;UNIT A VT52?
1143  007646 001404                         BEQ     1$              ;NO-USE UPPER CASE KEYBOARD.
1144  007650 004537 011534                  JSR     R5,AMSG         ;ISSUE VT52 ROW1 MESSAGE.
1145  007654 014300                         MKBB2
1146  007656 000403                         BR      2$
1147  007660 004537 011534          1$:     JSR     R5,AMSG
1148  007664 014163                         MKBB
1149  007666 004737 011652          2$:     JSR     PC,TSTROW       ;TEST THE ROW
1150
1151                                 ;TEST THE VT50H KEYPAD
1152
1153  007672 032737 010000 001256           BIT     #BIT12,VT5XX    ;TEST IF VT50H EXTRA KEYPAD
1154  007700 001526                         BEQ     KRBOON          ;;BR IF NOT DETECTED
1155  007702 004537 011534                  JSR     R5,AMSG         ;TELL OPERATOR THE TEST NAME
1156  007706 015364                         MKBN
1157  007710 012702 021122                  MOV     #ROW6,R2        ;LOAD ROW POINTER VALUES
1158  007714 004537 011534                  JSR     R5,AMSG
1159  007720 015153                         MKBI                    ;SET TOP ROW KEYPAD
1160  007722 004737 011652                  JSR     PC,TSTROW       ;TEST THAT ROW
1161  007726 012702 021142                  MOV     #ROW7,R2
1162  007732 004537 011534                  JSR     R5,AMSG         ;2ND ROW KEYPAD TEST
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 1163  007736  015206                        MKBJ
 1164  007740  004737  011652                JSR     PC,TSTROW       ;TEST 2ND KEYPAD ROW
 1165  007744  012702  021154                MOV     #ROW8,R2
 1166  007750  004537  011534                JSR     R5,AMSG
 1167  007754  015241                        MKBK
 1168  007756  004737  011652                JSR     PC,TSTROW       ;TEST 3RD KEYPAD ROW
 1169  007762  012702  021166                MOV     #ROW9,R2
 1170  007766  004537  011534                JSR     R5,AMSG         ;TELL ABOUT 4TH ROW
 1171  007772  015275                        MKBL
 1172  007774  004737  011652                JSR     PC,TSTROW       ;TEST 4TH ROW
 1173  010000  012702  021200                MOV     #ROW10,R2
 1174  010004  004537  011534                JSR     R5,AMSG
 1175  010010  015330                        MKBM
 1176  010012  004737  011652                JSR     PC,TSTROW       ;TEST 5TH ROW
 1177  010016  032737  001000  001256        BIT     #1000,VTSXX     ;IS UNIT A VT52?
 1178  010024  001454                        BEQ     KRBOON          ;NO-EXIT
 1179  010026  004537  011534                JSR     R5,AMSG         ;YES-TELL OPERATOR ALT. KEYPAD TEST.
 1180  010032  015413                        MKBS2
 1181  010034  004537  011534                JSR     R5,AMSG         ;PUT THE UNIT IN ALT. KEYPAD MODE.
 1182  010040  021063                        ENAKP
 1183  010042  012702  021206                MOV     #ROW6A,R2       ;LOAD ROW POINTER VALUES
 1184  010046  004537  011534                JSR     R5,AMSG
 1185  010052  015153                        MKBI                    ;SET TOP ROW KEYPAD
 1186  010054  004737  011652                JSR     PC,TSTROW       ;TEST THAT ROW
 1187  010060  012702  021266                MOV     #ROW7A,R2
 1188  010064  004537  011534                JSR     R5,AMSG         ;2ND ROW KEYPAD TEST
 1189  010070  015206                        MKBJ
 1190  010072  004737  011652                JSR     PC,TSTROW       ;TEST 2ND KEYPAD ROW
 1191  010076  012702  021354                MOV     #ROW8A,R2
 1192  010102  004537  011534                JSR     R5,AMSG
 1193  010106  015241                        MKBK
 1194  010110  004737  011652                JSR     PC,TSTROW       ;TEST 3RD KEYPAD ROW
 1195  010114  012702  021326                MOV     #ROW9A,R2
 1196  010120  004537  011534                JSR     R5,AMSG         ;TELL ABOUT 4TH ROW
 1197  010124  015275                        MKBL
 1198  010126  004737  011652                JSR     PC,TSTROW       ;TEST 4TH ROW
 1199  010132  012702  021360                MOV     #ROW10A,R2
 1200  010136  004537  011534                JSR     R5,AMSG
 1201  010142  015330                        MKBM
 1202  010144  004737  011652                JSR     PC,TSTROW       ;TEST 5TH ROW
 1203  010150  004537  011534                JSR     R5,AMSG         ;EXIT ALT. KEYPAD MODE.
 1204  010154  021070                        EXAKP
 1205
 1206                                  ;COMPLETION OF KEYBOARD-KEYPAD TEST
 1207
 1208  010156  004537  011534        KRBOON: JSR     R5,AMSG         ;END OF KEYBOARD TEST
 1209  010162  015552                        MKBR
 1210  010164  000137  007316                JMP     KRBTST          ;LOOP
 1211                                  ;*************************************************************
   (3)                                 ;*TEST 32       Z       KEYBOARD ECHO LOOP
   (3)                                 ;*************************************************************
   (2)  010170  000004                  TST32:  SCOPE
 1212  010172  012706  001100        KRBECH: MOV     #STACK,SP
 1213  010176  004537  011534                JSR     R5,AMSG         ;DISPLAY HEADER
 1214  010202  016052                        MKEH
 1215
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 1216  010204  004737  012536          1$:     JSR     PC,GETCHR       ;GET CHARACTER
 1217  010210  000775                          BR      1$
 1218  010212  110077  171064                  MOVB    R0,@VTOB        ;LOAD THE CHARACTER
 1219  010216  105777  171056          2$:     TSTB    @VTOS           ;WAIT FOR DONE
 1220  010222  100375                          BPL     2$
 1221  010224  000767                          BR      1$              ;LOOP BACK
 1222
 1223                                  ;LOAD A SINGLE CHARACTER ACROSS THE SCREEN WIDTH
 1224                                  ;
 1225
 1226  010226  013702  001316          FILBUF: MOV     WIDTH,R2        ;LOAD WIDTH VALUE
 1227  010232  012700  024312          FILBFB: MOV     #BUFFER,R0      ;SET-UP BUFFER POINTER
 1228  010236  112720  000015                  MOVB    #15,(R0)+       ;LOAD 'CR'
 1229  010242  112720  000012                  MOVB    #12,(R0)+       ;LOAD 'FL'
 1230  010246  110120                  FILBFA: MOVB    R1,(R0)+        ;SAVE THE CHARACTER IN THE BUFFER
 1231  010250  005302                          DEC     R2              ;FINISHED?
 1232  010252  001375                          BNE     FILBFA          ;BRANCH IF NOT COMPLETED
 1233  010254  112710  000377                  MOVB    #377,(R0)       ;LOAD TERM.
 1234  010260  000207                          RTS     PC              ;EXIT
 1235
 1236                                  ;LOAD A INCREMENTING CHARACTER ACROSS THE SCREEN WIDTH
 1237                                  ;ONLY 40 THRU 177 ARE LEGAL CHARACTERS
 1238
 1239  010262  012700  024312          LIC:    MOV     #BUFFER,R0      ;SET-UP BUFFER POINTER
 1240  010266  013502                          MOV     @(5)+,R2        ;SET-UP WIDTH
 1241  010270  112720  000015                  MOVB    #15,(R0)+       ;LOAD 'CR'
 1242  010274  112720  000012                  MOVB    #12,(R0)+       ;LOAD 'LF'
 1243  010300  110120                  LICA:   MOVB    R1,(0)+         ;SAVE A CHARACTER IN THE BUFFER
 1244  010302  005201                          INC     R1              ;UPDATE THE CHARACTER
 1245  010304  023701  001306                  CMP     LASTCH,R1       ;TEST FOR
 1246  010310  001002                          BNE     LICB            ;BRANCH IF NOT
 1247  010312  012701  000040                  MOV     #40,R1          ;MAKE A LEGAL CHARACTER
 1248  010316  005302                  LICB:   DEC     R2              ;DECREMENT COUNT
 1249  010320  001367                          BNE     LICA            ;BRANCH IF NOT COMPLETED
 1250  010322  112710  000377                  MOVB    #377,(R0)       ;LOAD TERM
 1251  010326  000205                          RTS     R5              ;EXIT
 1252
 1253                                  ;DISPLAY SUBROUTINE
 1254
 1255  010330  012700  024312          XPRNT:  MOV     #BUFFER,R0      ;SETUP BUFFER POINTER
 1256  010334  105777  170740          XPRNTA: TSTB    @VTOS           ;TEST READY
 1257  010340  100404                          BMI     XPRNTB          ;BRANCH IF SET
 1258  010342  005777  170732                  TST     @VTOS           ;TEST ERROR
 1259  010346  100372                          BPL     XPRNTA          ;BRANCH IF RESET
 1260  010350  104001                          ERROR   1               ;ERROR FLAG SET ON TRANSMITTER STATUS
 1261  010352  112001                  XPRNTB: MOVB    (0)+,R1
 1262  010354  100563                          BMI     1$              ;BR IF MINUS
 1263  010356  122701  000033          5$:     CMPB    #33,R1          ;TEST FOR ESC
 1264  010362  001003                          BNE     3$              ;BR IF NOT
 1265  010364  005237  010756                  INC     ANESC           ;SET SOFT FLAG
 1266  010370  000402                          BR      4$
 1267  010372  005037  010756          3$:     CLR     ANESC           ;CLEAR SOFT FLAG
 1268  010376  110177  170700          4$:     MOVB    R1,@VTOB        ;LOAD CHAR
 1269  010402  105777  170666                  TSTB    @VTIS           ;TEST INPUT FLAG
 1270  010406  100352                          BPL     XPRNTA          ;BR IF CLEARED
 1271  010410  005737  010756                  TST     ANESC           ;TEST IF ESC
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1275  010414  001347                    BNE     XPRNTA
1276  010416  013737  001252  012610 52$:  MOV     TIMED,TIME1
1277  010424  005037  012612            CLR     TIME2           ;LOAD DELAY
1278  010430  105777  170640       2$:  TSTB    @VTIS           ;TEST IF INPUT FLAG
1279  010434  100407                    BMI     53$             ;BR IF SET
1280  010436  005337  012612            DEC     TIME2           ;DELAY
1281  010442  001372                    BNE     2$
1282  010444  005337  012610            DEC     TIME1           ;DELAY
1283  010450  001367                    BNE     2$
1284  010452  000440                    BR      60$             ;REPORT ERROR
1285  010454  005737  010760 53$:  TST     IGNORE          ;IGNORE KEYBOARD CHARACTERS ?
1286  010460  001104                    BNE     15$             ;BR IF YES
1287  010462  017737  170610  001132    MOV     @VTIB,SBDDAT    ;READ CHAR
1288  010470  042737  177600  001132    BIC     #177600,SBDDAT  ;MASK
1289  010476  022737  000021  001132    CMP     #XON,SBDDAT     ;TEST FOR X ON
1290  010504  001003                    BNE     50$
1291  010506  005237  010754            INC     XONRC           ;SET FLAG
1292  010512  000710                    BR      XPRNTA          ;START AGAIN
1293  010514  022737  000023  001132 50$:  CMP     #XOFF,SBDDAT    ;TEST FOR X OFF
1294  010522  001020                    BNE     51$             ;BR IF NOT
1295  010524  005237  010752            INC     XOFFRC
1296  010530  005737  010746            TST     XOFFOK          ;XOFF ENABLED ?
1297  010534  001730                    BEQ     52$
1298  010536  012737  000001  010750    MOV     #1,AXOFF        ;SET X OFF SOFT FLAG
1299  010544  005737  010744            TST     XOFFBR          ;TEST
1300  010550  001271                    BNE     XPRNTA          ;BR BACK
1301  010552  000721                    BR      52$             ;BR
1302  010554  012737  000000  001130 60$:  MOV     #0,SGDDAT
1303  010562  000437                    BR      13$
1304  010564  105777  170310       51$:  TSTB    @SWR            ;TEST SWR
1305  010570  100371                    BPL     60$             ;BR IF CLEARED
1306  010572  012737  000057  001130    MOV     #'/,SGDDAT      ;LOAD EXPECTED
1307  010600  023737  001130  001132    CMP     SGDDAT,SBDDAT   ;COMPARE
1308  010606  001437                    BEQ     14$             ;BR IF EQUAL
1309  010610  012737  000134  001130    MOV     #'\,SGDDAT      ;LOAD EXPECTED
1310  010616  023737  001130  001132    CMP     SGDDAT,SBDDAT   ;COMPARE
1311  010624  001016                    BNE     13$             ;BR IF NOT
1312
1313                                ;"\" OR LOOP EXIT
1314
1315  010626  012737  000001  010742    MOV     #1,LOOP         ;SET SOFT FLAG
1316  010634  012737  017075  011000    MOV     #MSG,FINDTA     ;SETUP MESSAGE
1317  010642  005037  010744       16$:  CLR     XOFFBR
1318  010646  005037  010746            CLR     XOFFOK
1319  010652  005037  010760            CLR     IGNORE
1320  010656  000137  010770            JMP     FINDOT
1321
1322  010662  005737  010760       13$:  TST     IGNORE          ;IGNORE INPUT CHARACTER
1323  010666  001001                    BNE     15$
1324  010670  104004                    ERROR   4               ;UNEXPECTED OR INCORRECT INPUT FLAG
1325  010672  000240                15$:  NOP
1326  010674  000240                    NOP
1327  010676  000240                    NOP
1328  010700  000240                    NOP
1329  010702  000137  010334            JMP     XPRNTA
1330
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1331                                            ;"/" OR STANDARD EXIT
1332
1333  010706 005037 010742                      14$:    CLR     LOOP
1334  010712 012737 017162 011000                       MOV     #M01,FINDTA     ;SETUP MESSAGE
1335  010720 000137 010642                              JMP     16$
1336
1337                                            ;NORMAL EXIT
1338
1339  010724 005037 010746                      1$:     CLR     XOFFOK
1340  010730 005037 010760                              CLR     IGNORE
1341  010734 005037 010744                              CLR     XOFFBR
1342  010740 000207                                     RTS     PC              ;EXIT
1343
1344  010742 000000                             LOOP:   0
1345  010744 000000                             XOFFBR: 0
1346  010746 000000                             XOFFOK: 0
1347  010750 000000                             AXOFF:  0
1348  010752 000000                             XOFFRC: 0
1349  010754 000000                             XONRC:  0
1350  010756 000000                             ANESC:  0
1351  010760 000000                             IGNORE: 0               ;WHEN SET IGNORE KEYBOARD FLAGS
1352
1353                                            ;DETERMINE THE  TEST TO GO TO
1354  010762 004537 011534                      FNDA:   JSR     R5,AMSG
1355  010766 017250                                     M02                     ;ERROR ASK AGAIN
1356  010770 012706 001100                      FINDOT: MOV     #STACK,SP
1357  010774 004537 011534                              JSR     R5,AMSG
1358  011000 017162                             FINDTA: M01
1359  011002 004737 012536                              JSR     PC,GETCHR
1360  011006 000770                                     BR      FINDOT
1361  011010 042700 100600                              BIC     #100600,R0      ;MASK
1362  011014 122700 000101                              CMPB    #'A,R0          ;TEST FOR NUMBER
1363  011020 101360                                     BHI     FNDA
1364  011022 122700 000132                              CMPB    #'Z,R0          ;TEST FOR OTHERS
1365  011026 103755                                     BLO     FNDA
1366  011030 042700 177740                              BIC     #177740,R0      ;MAKE 0-32
1367  011034 005300                                     DEC     R0
1368  011036 110037 001106                              MOVB    R0,STSTNM       ;LOAD THAT TEST #
1369  011042 006300                                     ASL     R0
1370  011044 005760 011070                              TST     DSPCH(R0)       ;TEST IF VALID
1371  011050 001744                                     BEQ     FNDA                    ;BR IF NOT
1372  011052 000240                                     NOP
1373  011054 000240                                     NOP
1374  011056 016037 011070 001112                      MOV     DSPCH(R0),SLPADR        ;LOAD LOOP ADDRESS
1375  011064 000170 011070                              JMP     @DSPCH(R0)      ;GO TO THAT TEST
1376
1377                                            ;SUBTEST DISPATCH TABLE
1378
1379  011070 001762                             DSPCH:  TST1+2
1380  011072 002402                                     TST2+2
1381  011074 002422                                     TST3+2
1382  011076 002476                                     TST4+2
1383  011100 002576                                     TST5+2
1384  011102 002700                                     TST6+2
1385  011104 003342                                     TST7+2
1386  011106 003712                                     TST10+2
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 1387  011110  004070                        TST11+2
 1388  011112  004216                        TST12+2
 1389  011114  004354                        TST13+2
 1390  011116  005014                        TST14+2
 1391  011120  005164                        TST15+2
 1392  011122  005276                        TST16+2
 1393  011124  005446                        TST17+2
 1394  011126  005516                        TST20+2
 1395  011130  005572                        TST21+2
 1396  011132  005724                        TST22+2
 1397  011134  006060                        TST23+2
 1398  011136  006202                        TST24+2
 1399  011140  006260                        TST25+2
 1400  011142  006372                        TST26+2
 1401  011144  006426                        TST27+2
 1402  011146  007022                        TST30+2
 1403  011150  007316                        TST31+2
 1404                          ;SUBROUTINE TO LOAD COPIER TEST
 1405
 1406  011152  012700  024312  FIRLST: MOV     #BUFFER,R0
 1407  011156  112720  000015          MOVB    #15,(R0)+       ;LOAD CR
 1408  011162  112720  000012          MOVB    #12,(R0)+       ;LOAD LF
 1409  011166  112720  000105          MOVB    #'E,(R0)+
 1410  011172  112720  000105          MOVB    #'E,(R0)+
 1411  011176  112720  000105          MOVB    #'E,(R0)+
 1412  011202  013702  001316          MOV     WIDTH,R2        ;LOAD WIDTH
 1413  011206  163702  001266          SUB     VH1,R2
 1414  011212  005302                  DEC     R2
 1415  011214  112720  000040  1$:     MOVB    #40,(R0)+       ;LOAD A SPACE
 1416  011220  005302                  DEC     R2              ;DONE ?
 1417  011222  100374                  BPL     1$              ;BR UNTIL DONE
 1418  011224  112720  000105          MOVB    #'E,(R0)+
 1419  011230  112720  000105          MOVB    #'E,(R0)+
 1420  011234  112720  000105          MOVB    #'E,(R0)+       ;LOAD 80 TH
 1421  011240  112710  000377          MOVB    #377,(R0)       ;LOAD TERM
 1422  011244  000207                  RTS     PC              ;EXIT
 1423
 1424                          ;SUBROUTINE FOR THE DATA PATH TEST
 1425
 1426  011246  012700  024312  DTPSR:  MOV     #BUFFER,R0
 1427  011252  012501          DTPSRB: MOV     (5)+,R1         ;GET FIRST CHARACTER
 1428  011254  012502                  MOV     (5)+,R2         ;GET SECOND CHARACTER
 1429  011256  013703  001316          MOV     WIDTH,R3                ;SET THE WIDTH
 1430  011262  006203                  ASR     R3              ;DIVIDE BY 2
 1431  011264  112720  000015          MOVB    #15,(R0)+       ;LOAD 'CR'
 1432  011270  112720  000012          MOVB    #12,(R0)+       ;LOAD 'LF'
 1433  011274  110120          DTPSRA: MOVB    R1,(0)+         ;
 1434  011276  110220                  MOVB    R2,(0)+
 1435  011300  005303                  DEC     R3
 1436  011302  100374                  BPL     DTPSRA
 1437  011304  112710  000377          MOVB    #377,(R0)       ;LOAD TERM
 1438  011310  000205                  RTS     R5
 1439
 1440                          ;SUBROUTINE TO LOAD BUFFER WITH GRAPHICS CHARACTERS
 1441
 1442  011312  012700  024312  GRBUF:  MOV     #BUFFER,R0      ;LOAD BUFFER ADDRESS
```

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 1443  011316  012701  000136            MOV     #136,R1         ;LOAD INITIAL CHAR.
 1444  011322  010402                     MOV     R4,R2           ;LOAD BUFFER COUNT
 1445  011324  110120            1$:     MOVB    R1,(R0)+        ;INSERT A CHAR. IN THE BUFFER
 1446  011326  005201                     INC     R1              ;INCREMENT CHAR.
 1447  011330  122701  000177            CMPB    #177,R1         ;AT END OF GRAPHICS STRING?
 1448  011334  001002                     BNE     2$              ;NO
 1449  011336  012701  000136            MOV     #136,R1         ;YES-RESET IT TO 1ST GRAPH. CHAR.
 1450  011342  005302            2$:     DEC     R2              ;DECREMENT BUFFER COUNT.
 1451  011344  001367                     BNE     1$              ;NOT AT END-LOOP
 1452  011346  112710  000377            MOVB    #377,(R0)       ;END OF BUFFER-INSERT TERMINATOR
 1453  011352  000207                     RTS     PC              ;AND EXIT.
 1454
 1455                                     ;PROGRAM DELAY ROUTINE
 1456
 1457  011354  013737  001254  011456 DELAY:  MOV     SUBTST,10$      ;LOAD COUNT
 1458  011362  005037  011460            CLR     11$
 1459  011366  005737  001330            TST     WFTEST          ;TEST IF W.F. MODE
 1460  011372  001413                     BEQ     2$              ;BR IF NOT
 1461  011374  006237  011456            ASR     10$             ;CHANGE DELAY TIMER
 1462  011400  006237  011456            ASR     10$
 1463  011404  006237  011456            ASR     10$
 1464  011410  000240                     NOP
 1465  011412  000240                     NOP
 1466  011414  000240                     NOP
 1467  011416  000240                     NOP
 1468  011420  000240                     NOP
 1469  011422  032777  010000  167450 2$:     BIT     #BIT12,@SWR     ;TEST SR
 1470  011430  001006                     BNE     3$              ;BR IF SET
 1471  011432  005337  011460            DEC     11$             ;DELAY
 1472  011436  001371                     BNE     2$
 1473  011440  005337  011456            DEC     10$
 1474  011444  100366                     BPL     2$              ;DELAY
 1475  011446  000240            3$:     NOP
 1476  011450  000240                     NOP
 1477  011452  000240                     NOP
 1478  011454  000207                     RTS     PC              ;EXIT
 1479
 1480  011456  000002            10$:    2
 1481  011460  000000            11$:    0
 1482
 1483  011462  013737  001254  011530 ADELAY: MOV     SUBTST,10$
 1484  011470  005037  011532            CLR     11$
 1485  011474  006237  011530            ASR     10$
 1486  011500  006237  011530            ASR     10$
 1487  011504  005337  011532 2$:     DEC     11$
 1488  011510  001375                     BNE     2$
 1489  011512  005337  011530            DEC     10$
 1490  011516  100372                     BPL     2$
 1491  011520  000240                     NOP
 1492  011522  000240                     NOP
 1493  011524  000240                     NOP
 1494  011526  000207                     RTS     PC
 1495  011530  000000            10$:    0
 1496  011532  000000            11$:    0
 1497
 1498
```

```
 1499                                   ;HEADER SUBROUTINE FOR VT-50
 1500
 1501  011534  012537  011544          AMSG:   MOV     (R5)+,10$       ;GET POINTER
 1502  011540  004537  012614          1$:     JSR     R5,MTOB         ;MOVE TO BUFFER
 1503  011544  000000                  10$:    0
 1504  011546  004737  010330          11$:    JSR     PC,XPRNT        ;DISPLAY IT
 1505  011552  000205                          RTS     R5              ;EXIT
 1506
 1507
 1508                                   ;OCTAL - 3 BIT CONVERSION
 1509
 1510  011554  010001                  OCTAL:  MOV     R0,R1           ;LOAD R1
 1511  011556  042701  177770                  BIC     #177770,R1      ;MASK
 1512  011562  062701  000060                  ADD     #60,R1
 1513  011566  110137  011650                  MOVB    R1,DIG2         ;SAVE LSD
 1514  011572  010001                          MOV     R0,R1
 1515  011574  006001                          ROR     R1
 1516  011576  006001                          ROR     R1
 1517  011600  006001                          ROR     R1
 1518  011602  042701  177770                  BIC     #177770,R1
 1519  011606  062701  000060                  ADD     #60,R1
 1520  011612  110137  011646                  MOVB    R1,DIG1         ;SAVE IT
 1521  011616  010001                          MOV     R0,R1
 1522  011620  006101                          ROL     R1
 1523  011622  006101                          ROL     R1
 1524  011624  000301                          SWAB    R1
 1525  011626  042701  177770                  BIC     #177770,R1
 1526  011632  062701  000060                  ADD     #60,R1
 1527  011636  110137  011644                  MOVB    R1,DIG0         ;SAVE MSD
 1528  011642  000207                          RTS     PC              ;EXIT
 1529
 1530  011644  000000                  DIG0:   0
 1531  011646  000000                  DIG1:   0
 1532  011650  000000                  DIG2:   0
 1533
 1534                                   ;SUBROUTINE FOR THE KEYBOARD CHARACTER TEST
 1535
 1536  011652  004537  011534          TSTROW: JSR     R5,AMSG         ;DISPLAY HEADER
 1537  011656  014074                          MKBA
 1538
 1539  011660  004737  012536          1$:     JSR     PC,GETCHR       ;GET CHAR
 1540  011664  000775                          BR      1$              ;;BR BACK IF NO INPUT
 1541  011666  012737  177600  012244          MOV     #177600,MASK1
 1542  011674  005037  012246                  CLR     MASK2
 1543  011700  032777  000004  167172          BIT     #BIT2,@SWR      ;TEST SWR
 1544  011706  001416                          BEQ     4$              ;DO NOT TEST PARITY BIT
 1545  011710  042737  000200  012244          BIC     #BIT7,MASK1     ;ENABLE PARITY BIT
 1546  011716  032777  000002  167154          BIT     #BIT1,@SWR      ;TEST IF FORCED PARITY
 1547  011724  001424                          BEQ     5$              ;BR IF NOT FORCED PARITY BIT
 1548  011726  032777  000001  167144          BIT     #BIT0,@SWR      ;TEST FOR EVEN/ODD PARITY
 1549  011734  001403                          BEQ     4$              ;BR IF ALLWAYS OFF
 1550  011736  052737  000200  012246          BIS     #BIT7,MASK2     ;SET BIT 7
 1551  011744  011237  012240          4$:     MOV     (R2),10$        ;GET EXPECTED
 1552  011750  053737  012246  012240          BIS     MASK2,10$       ;SET BIT 7 IF EXPECTED
 1553  011756  043700  012244                  BIC     MASK1,R0        ;MASK VALUE READ
 1554  011762  120037  012240                  CMPB    R0,10$          ;COMPARE CHARS
```

```
 1555  011766  001041                        BNE     2$              ;BR IF NOT EQUAL
 1556  011770  005722                        TST     (R2)+           ;BUMP R2
 1557  011772  100332                        BPL     1$              ;LOOP TILL DONE
 1558  011774  000207                        RTS     PC              ;EXIT
 1559
 1560                                ;COME HERE ONLY IF TESTING "PARITY" OPTION
 1561
 1562  011776  005037  012242        5$:     CLR     10$             ;CLEAR TEMP
 1563  012002  011237  012240                MOV     (R2),100$       ;CLEAR CHAR SAVE
 1564  012006  006037  012240        20$:    ROR     100$            ;ROTATE CHAR
 1565  012012  103002                        BCC     21$             ;BR IF NO CARRY
 1566  012014  005237  012242                INC     10$             ;UPDATE CNT
 1567  012020  105737  012240        21$:    TSTB    100$            ;DONE ?
 1568  012024  001370                        BNE     20$             ;BR IF NOT
 1569  012026  032777  000001  167044        BIT     #BIT0,2SWR      ;TEST EVEN/ODD
 1570  012034  001407                        BEQ     23$             ;BR IF OPER. SAYS EVEN
 1571  012036  006037  012242                ROR     10$             ;
 1572  012042  103403                        BCS     22$             ;BR IF ODD ALREADY
 1573  012044  052737  000200  012246        BIS     #BIT7,MASK2     ;SET PARITY BIT
 1574  012052  000734                22$:    BR      4$              ;BR TO TEST CHAR
 1575  012054  006037  012242        23$:    ROR     10$             ;
 1576  012060  103003                        BCC     24$             ;BR IF EVEN ALREADY
 1577  012062  052737  000200  012246        BIS     #BIT7,MASK2
 1578  012070  000725                24$:    BR      4$              ;BR TO TEST CHAR
 1579
 1580                                ;COME HERE IF EXPECTED NOT EQUAL TO RECVD
 1581                                ;CONVERT RESULTS TO OCTAL FOR TYPEOUT
 1582
 1583  012072  010037  001132        2$:     MOV     R0,$BODAT       ;LOAD BAD CHARACTER
 1584  012076  004737  011554                JSR     PC,OCTAL        ;CONVERT TO OCTAL
 1585  012102  113737  011644  015543        MOVB    DIG0,MKBQB      ;LOAD OCTAL #
 1586  012110  113737  011646  015544        MOVB    DIG1,MKBQB+1
 1587  012116  113737  011650  015545        MOVB    DIG2,MKBQB+2
 1588  012124  042700  177600                BIC     #177600,R0
 1589  012130  120027  000040                CMPB    R0,#40          ;TEST IF PRINTABLE
 1590  012134  101002                        BHI     10$             ;BR IF PRINTABLE
 1591  012136  112700  000056                MOVB    #56,R0          ;CONVERT TO A "*" CHARACTER
 1592  012142  110037  015537        10$:    MOVB    R0,MKBQ2        ;SAVE CHAR
 1593  012146  011200                        MOV     (R2),R0         ;GET GOOD CHAR
 1594  012150  053700  012246                BIS     MASK2,R0
 1595  012154  010037  001130                MOV     R0,$GODAT       ;LOAD GOOD CHARACTER
 1596  012160  004737  011554                JSR     PC,OCTAL        ;CONVERT IT
 1597  012164  113737  011644  015524        MOVB    DIG0,MKBQA      ;LOAD DIGIT
 1598  012172  113737  011646  015525        MOVB    DIG1,MKBQA+1
 1599  012200  113737  011650  015526        MOVB    DIG2,MKBQA+2
 1600  012206  042700  177600                BIC     #177600,R0
 1601  012212  110037  015520                MOVB    R0,MKBQ1        ;SAVE CHAR
 1602
 1603  012216  023737  001274  001142        CMP     VTIS,$TKS       ;TEST IF ON CTY
 1604  012224  001403                        BEQ     3$              ;BR IF YES
 1605
 1606  012226  004537  011534                JSR     R5,AMSG         ;DISPLAY ERROR  MESSAGE
 1607  012232  015457                        MKBQ
 1608  012234  104004                3$:     ERROR   4               ;CHARACTER RECVD NOT EQUAL TO EXPECTED
 1609  012236  000610                        BR      1$              ;BR BACK AND TEST THE CHARACTER AGAIN
 1610
```

```
 1611  012240  000000                    100$:   0
 1612  012242  000000                    101$:   0
 1613  012244  177600                    MASK1:  177600
 1614  012246  000000                    MASK2:  0
 1615
 1616                                    ;*****************************************************************
  (1)
  (1)                                    .SBTTL  CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
  (1)
  (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)
  (2)   012250                           $TYPDS:
  (3)   012250  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
  (3)   012252  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
  (3)   012254  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
  (3)   012256  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
  (3)   012260  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
  (1)   012262  012746  020200                  MOV     #20200,-(SP)    ;;SET BLANK SWITCH AND SIGN
  (1)   012266  016605  000020                  MOV     20(SP),R5       ;;GET THE INPUT NUMBER
  (1)   012272  100004                          BPL     1$              ;;BR IF INPUT IS POS.
  (1)   012274  005405                          NEG     R5              ;;MAKE THE BINARY NUMBER POS.
  (1)   012276  112766  000055  000001          MOVB    #'-,1(SP)       ;;MAKE THE ASCII NUMBER NEG.
  (1)   012304  005000                  1$:     CLR     R0              ;;ZERO THE CONSTANTS INDEX
  (1)   012306  012703  012464                  MOV     #$DBLK,R3       ;;SETUP THE OUTPUT POINTER
  (1)   012312  112723  000040                  MOVB    #' ,(R3)+       ;;SET THE FIRST CHARACTER TO A BLANK
  (1)   012316  005002                  2$:     CLR     R2              ;;CLEAR THE BCD NUMBER
  (1)   012320  016001  012454                  MOV     $DTBL(R0),R1    ;;GET THE CONSTANT
  (1)   012324  160105                  3$:     SUB     R1,R5           ;;FORM THIS BCD DIGIT
  (1)   012326  002402                          BLT     4$              ;;BR IF DONE
  (1)   012330  005202                          INC     R2              ;;INCREASE THE BCD DIGIT BY 1
  (1)   012332  000774                          BR      3$
  (1)   012334  060105                  4$:     ADD     R1,R5           ;;ADD BACK THE CONSTANT
  (1)   012336  005702                          TST     R2              ;;CHECK IF BCD DIGIT=0
  (1)   012340  001002                          BNE     5$              ;;FALL THROUGH IF 0
  (1)   012342  105716                          TSTB    (SP)            ;;STILL DOING LEADING 0'S?
  (1)   012344  100407                          BMI     7$              ;;BR IF YES
  (1)   012346  106316                  5$:     ASLB    (SP)            ;;MSD?
  (1)   012350  103003                          BCC     6$              ;;BR IF NO
  (1)   012352  116663  000001  177777          MOVB    1(SP),-1(R3)    ;;YES--SET THE SIGN
  (1)   012360  052702  000060          6$:     BIS     #'0,R2          ;;MAKE THE BCD DIGIT ASCII
  (1)   012364  052702  000040          7$:     BIS     #' ,R2          ;;MAKE IT A SPACE IF NOT ALREADY A DIGIT
  (1)   012370  110223                          MOVB    R2,(R3)+        ;;PUT THIS CHARACTER IN THE OUTPUT BUFFER
  (1)   012372  005720                          TST     (R0)+           ;;JUST INCREMENTING
  (1)   012374  020027  000010                  CMP     R0,#10          ;;CHECK THE TABLE INDEX
  (1)   012400  002746                          BLT     2$              ;;GO DO THE NEXT DIGIT
  (1)   012402  003002                          BGT     8$              ;;GO TO EXIT
  (1)   012404  010502                          MOV     R5,R2           ;;GET THE LSD
  (1)   012406  000764                          BR      6$              ;;GO CHANGE TO ASCII
  (1)   012410  105726                  8$:     TSTB    (SP)+           ;;WAS THE LSD THE FIRST NON-ZERO?
```

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(1)  012412  100003                        BPL     9$                ;;BR IF NO
(1)  012414  116663  177777  177776        MOVB    -1(SP),-2(R3)     ;;YES--SET THE SIGN FOR TYPING
(1)  012422  105013                 9$:    CLRB    (R3)              ;;SET THE TERMINATOR
(3)  012424  012605                        MOV     (SP)+,R5          ;;POP STACK INTO R5
(3)  012426  012603                        MOV     (SP)+,R3          ;;POP STACK INTO R3
(3)  012430  012602                        MOV     (SP)+,R2          ;;POP STACK INTO R2
(3)  012432  012601                        MOV     (SP)+,R1          ;;POP STACK INTO R1
(3)  012434  012600                        MOV     (SP)+,R0          ;;POP STACK INTO R0
(1)  012436  104400  012464                TYPE    $DBLK             ;;NOW TYPE THE NUMBER
(1)  012442  016666  000002  000004        MOV     2(SP),4(SP)       ;;ADJUST THE STACK
(1)  012450  012616                        MOV     (SP)+,(SP)
(1)  012452  000002                        RTI                       ;;RETURN TO USER
(1)  012454  023420                 $DTBL: 10000.
(1)  012456  001750                        1000.
(1)  012460  000144                        100.
(1)  012462  000012                        10.
(1)  012464  000004                 $DBLK: .BLKW   4
1617
1618                                        ;SUBROUTINE TO FILL THE SCREEN WITH AN CHARACTER
1619
1620 012474  012701  000105                FILLWC: MOV     #'E,R1            ;LOAD CHARACTER BYTE
1621 012500  004737  010226                        JSR     PC,FILBUF         ;LOAD THE LINE WITH CHAR
1622 012504  013737  001264  012534                MOV     VHD,10$           ;LOAD COUNT
1623 012512  012737  000001  010746         1$:    MOV     #1,XOFFOK         ;INSURE XOFF/XON CONTROL.
1624 012520  004737  010330                        JSR     PC,XPRNT          ;DISPLAY THE LINE
1625 012524  005337  012534                        DEC     10$
1626 012530  001370                        BNE     1$                ;LOOP UNTIL DONE
1627 012532  000207                        RTS     PC                ;EXIT
1628 012534  000000                 10$:   0
1629
1630                                        ;SUBROUTINE TO GET A CHARACTER FROM THE VT50
1631
1632 012536  013737  00125   12610  GETCHR: MOV     TIME0,TIME1       ;LOAD TIME COUNTER
1633 012544  005037  012612                CLR     TIME2
1634
1635 012550  105777  166520         1$:    TSTB    @VTIS             ;TEST INPUT STATUS
1636 012554  100005                        BPL     2$                ;BR IF CLEARED
1637 012556  017700  166514                MOV     @VTIB,R0          ;READ A CHAR
1638 012562  062716  000002                ADD     #2,(SP)           ;UPDATE RETURN
1639 012566  000207                        RTS     PC                ;EXIT
1640
1641 012570  005337  012612         2$:    DEC     TIME2             ;DELAY
1642 012574  001365                        BNE     1$
1643 012576  005337  012610                DEC     TIME1             ;FINISHED ?
1644 012602  100362                        BPL     1$                ;LOOP TILL TIME EXPIRED
1645 012604  104002                        ERROR   2                 ;NO INPUT FLAG FROM DEVICE
1646 012606  000207                        RTS     PC                ;EXIT
1647
1648 012610  000000                 TIME1: 0
1649 012612  000000                 TIME2: 0
1650
1651                                        ;MOVE TO THE OUTPUT BUFFER
1652
1653 012614  012500                 MTOB:  MOV     (R5)+,R0          ;LOAD DEST.
1654 012616  012701  024312                MOV     #BUFFER,R1        ;LOAD R1
1655 012622  112021                 1$:    MOVB    (R0)+,(R1)+       ;LOAD BYTE
```

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 1656  012624  100376                          BPL     1$              ;BR UNTIL DONE
 1657  012626  000205                          RTS     R5              ;EXIT
 1658
 1659                                          .SBTTL  ASCII MESSAGES
 1660
 1661                                  ;ASCII MESSAGES
 1662
 1663  012630  006415  046412  044501  TITLE:  .ASCIZ  <15><15><12>\MAINDEC-11-DZVTC-C VTSOA, B, VTSOH AND VTS2 ACCEPTANCE TEST
       012636  042116  041505  030455
       012644  026461  055104  052126
       012652  026503  020103  052126
       012660  030065  026101  041040
       012666  020054  052126  030065
       012674  020110  047101  020104
       012702  052126  031066  040440
       012710  041503  050105  040524
       012716  041516  020105  042524
       012724  052123  005015      000
 1664  012731      015  020012  043040  M91:    .ASCIZ  <15><12>/  FULL SCREEN OF THE CHARACTER E/<15><12><377>
       012736  046125  020114  041523
       012744  042522  047105  047440
       012752  020106  044124  020105
       012760  044103  051101  041501
       012766  042524  020122  006505
       012774  177412      000
 1665  012777      015  020012  042040  M92:    .ASCIZ  <15><12>/  DATA PATH TEST /<15><12><377>
       013004  052101  020101  040520
       013012  044124  052040  051505
       013020  020124  005015  000377
 1666  013026  005015  020040  044523  M93:    .ASCIZ  <15><12>/  SINGLE CHARACTER PER LINE /<15><12><377>
       013034  043516  042514  041440
       013042  040510  040522  052103
       013050  051105  050040  051105
       013056  046040  047111  020105
       013064  005015  000377
 1667  013070  005015  020040  047522  M94:    .ASCIZ  <15><12>/  ROTATING PATTERN /<15><12><377>
       013076  040524  044524  043516
       013104  050040  052101  042524
       013112  047122  006440  177412
       013120      000
 1668  013121      015  020012  041440  M96:    .ASCIZ  <15><12>/  CURSOR MOTION TEST /<15><12><377>
       013126  051125  047523  020122
       013134  047515  044524  047117
       013142  052040  051505  020124
       013150  005015  000377
 1669  013154  005015  020040  040524  M97:    .ASCIZ  <15><12>/  TAB, BACKSPACE AND BELL TEST  /<15><12><377>
       013162  026102  041040  041501
       013170  051513  040520  042503
       013176  040440  042116  041040
       013204  046105  020114  042524
       013212  052123  020040  005015
       013220  000377
 1670  013222  005015  020040  051105  M910:   .ASCIZ  <15><12>/  ERASE LINE TEST  /<15><12><377>
       013230  051501  020105  044514
       013236  042516  052040  051505
       013244  020124  006440  177412
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                013252      000
1671            013253      015  020012  042440  M911:   .ASCIZ  <15><12>/  ERASE SCREEN TEST  /<15><12><377>
                013260  040522  042523  051440
                013266  051103  042505  020116
                013274  042524  052123  020040
                013302  005015  000377
1672            013306  005015  020040  044526  M912:   .ASCIZ  <15><12>/  VIDEO COUPLING TEST /<15><12><377>
                013314  042504  020117  047503
                013322  050125  044514  043516
                013330  052040  051505  020124
                013336  005015  000377
1673            013342  044033  045033  005015  M914:   .ASCIZ  <33><110><33><112><15><12>/  TERMINAL IDENTIFIER TEST /<15><12><377>
                013350  020040  042524  046522
                013356  047111  046101  044440
                013364  042504  052116  043111
                013372  042511  020122  042524
                013400  052123  006440  177412
                013406      000
1674            013407      015  020012  041440  M920:   .ASCIZ  <15><12>/  COPIER PERIMETER/<15><12><377>
                013414  050117  042511  020122
                013422  042520  044522  042515
                013430  042524  006522  177412
                013436      000
1675            013437      015  020012  042040  M921:   .ASCIZ  <15><12>/  DISCLAIMER STATEMENT/<15><12><377>
                013444  051511  046103  044501
                013452  042515  020122  052123
                013460  052101  046505  047105
                013466  006524  177412      000
1676            013473      015  020012  044040  M922:   .ASCIZ  <15><12>/  HOLD SCREEN MODE TEST/<15><12><377>
                013500  046117  020104  041523
                013506  042522  047105  046440
                013514  042117  020105  042524
                013522  052123  005015  000377
1677            013530  005015  020040  051107  M9221:  .ASCIZ  <15><12>/  GRAPHICS MODE AND REV. LINE FEED TEST/<15><12><377>
                013536  050101  044510  051503
                013544  046440  042117  020105
                013552  047101  020104  042522
                013560  027126  046040  047111
                013566  020105  042506  042105
                013574  052040  051505  006524
                013602  177412      000
1678            013605      033  015537  015510  M923:   .ASCIZ  <33><137><33><110><33><112>/  AUTO COPY MODE TEST/<15><12><377>
                013612  020112  040440  052125
                013620  020117  047503  054520
                013626  046440  042117  020105
                013634  042524  052123  005015
                013642  000377
1679            013644  044033  045033  051120  MPTCNT: .ASCIZ  <33><110><33><112>/PRINTER CONTROLLER MODE ENTERED/<15><12><377>
                013652  047111  042524  020122
                013660  047503  052116  047522
                013666  046114  051105  046440
                013674  042117  020105  047105
                013702  042524  042522  006504
                013710  177412      000
1680            013713      033  015510  050112  MPTSCN: .ASCIZ  <33><110><33><112>/PRINT A SCREEN OF E'S/<15><12><377>
                013720  044522  052116  040440
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                013726  051440  051103  042505
                013732  020116  043117  042440
                013736  051447  005015  000377
1681            013750  015610  020113  040440  M923A:  .ASCIZ  <110><33><112>/  AUTO PRINT MODE TEST/<15><12><377>
                013756  051125  020117  051120
                013764  047111  020124  047515
                013772  042504  052040  051505
                014000  006524  177412  000
1682            014005     015  020013  042513  MKB:    .ASCII  <15><12>/ KEYBOARD CHARACTER TEST/<15><12>
                014012  041131  040517  042122
                014020  041440  040510  040524
                014026  052103  051105  052040
                014034  051505  006524  012
1683            014041     122  046105  040505  MKB1:   .ASCIZ  /RELEASE THE "SHIFT" KEY/<15><12><377>
                014046  042523  052040  040510
                014054  021040  044123  043111
                014062  051124  046440  054505
                014070  005015  000377
1684            014074  005015  042514  052105  MKBA:   .ASCIZ  <15><12>/LEFT TO RIGHT IN A ROW, DEPRESS ONE KEY AT A TIME/<15><12><377>
                014102  052040  020117  044522
                014110  044107  020124  047111
                014116  040440  051040  053517
                014124  020054  042504  051120
                014132  051505  020123  047117
                014140  020105  042513  020131
                014146  052101  040440  052040
                014154  046511  006505  177412
                014162     000
1685            014165     015  051412  040524  MKBB:   .ASCII  <15><12>/STARTING WITH THE TOP ROW EXCEPT THE THIRD/
                014172  052122  047111  020107
                014176  044527  044124  052040
                014204  042510  052040  020117
                014212  051040  053517  042440
                014220  041520  050105  020124
                014226  044124  020105  044124
                014234  051111     104
1686            014237     040  051106  046517          .ASCIZ  / FROM RIGHT END AND LAST KEYS/<15><12><377>
                014244  051040  043511  052110
                014252  042440  042116  040440
                014260  042116  046040  051501
                014266  020124  042513  051531
                014274  005015  000377
1687            014300  005015  052123  051101  MKBB2:  .ASCIZ  <15><12>/STARTING WITH THE TOP ROW EXCEPT THE LAST KEY/<15><12><377>
                014306  044524  043516  053440
                014314  052111  020110  044124
                014322  020105  047524  020120
                014330  047522  020127  054105
                014336  042503  052120  052040
                014344  042510  046040  051501
                014352  020124  042513  006531
                014360  177412     000
1688            014363     015  051412  040524  MKBC:   .ASCIZ  <15><12>/START WITH THE SECOND ROW/<15><12><377>
                014370  052122  053440  052111
                014376  020110  044124  020105
                014404  042523  047503  042116
                014412  051040  053517  005015
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      014420  000377
1689  014422  005015  052123  051101  MKBD:   .ASCII  <15><12>/START WITH THE THIRD ROW EXCEPT THE CTRL/
      014430  020124  044527  044124
      014436  052040  042510  052040
      014444  044510  042122  051040
      014452  053517  042440  041530
      014460  050105  020124  044124
      014466  020105  052103  046122
1690  014474  005015  040440  042116          .ASCIZ  <15><12>/ AND THE "BLANK" KEYS/<15><12><377>
      014502  052040  042510  021040
      014510  046102  047101  021113
      014516  042440  054505  006523
      014524  177412     000
1691  014527     015  051412  040524  MKBD2:  .ASCIZ  <15><12>/START WITH THE THIRD ROW ,BEGIN ROW WITH "A" KEY/<15><12><377>
      014534  052122  053440  052111
      014542  020110  044124  020105
      014550  044124  051111  020104
      014556  047522  020127  041054
      014564  043505  047111  051040
      014572  053517  053440  052111
      014600  020110  040442  020042
      014606  042513  006531  177412
      014614     000
1692  014615     015  051412  040524  MKBE:   .ASCII  <15><12>/START WITH THE FOURTH ROW EXCEPT THE SCROLL/
      014622  052122  053440  052111
      014630  020110  044124  020105
      014636  047506  051125  044124
      014644  051040  053517  042440
      014652  041530  050105  020124
      014660  044124  020105  041523
      014666  047522  046114
1693  014672  005015  051454  044510          .ASCIZ  <15><12>/,SHIFT, REPEAT AND AUTO-PRINT/<15><12><377>
      014700  052106  020054  042522
      014706  042520  052101  040440
      014714  042116  040440  052125
      014722  026517  051120  047111
      014730  006524  177412     000
1694  014735     015  051412  040524  MKBF:   .ASCIZ  <15><12>/START WITH THE FIFTH ROW/<15><12><377>
      014742  052122  053440  052111
      014750  020110  044124  020105
      014756  044506  052106  020110
      014764  047522  006527  177412
      014772     000
1695  014773     015  047012  053517  MKBG:   .ASCII  <15><12>/NOW HOLD DOWN THE "LEFT-SHIFT" KEY/<15><12><377>
      015000  044040  046117  020104
      015006  047504  047127  052040
      015014  042510  021040  042514
      015022  052106  051455  044510
      015030  052106  020042  042513
      015036  006531  177412
1696  015042  005015  047516  020127  MKBGA:  .ASCII  <15><12>/NOW HOLD DOWN THE "RIGHT-SHIFT" KEY/<15><12><377>
      015050  047510  042114  042040
      015056  053517  020116  044124
      015064  020105  051042  043511
      015072  052110  051455  044510
      015100  052106  020042  042513
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                015106  006531  177412
1697            015112  005015  047516  020127  MKBH:   .ASCII  <15><12>/NOW HOLD DOWN THE "CTRL" KEY/<15><12><377>
                015120  047510  042114  042040
                015126  052512  020116  044124
                015134  020105  041440  051124
                015142  020114  045440  054505
                015150  005015     377
1698            015153     015  051412  040524  MKBI:   .ASCII  <15><12>/START WITH THE TOP ROW/<15><12><377>
                015160  052122  053440  052111
                015166  020110  044124  020105
                015174  047524  020120  047522
                015202  006527  177412
1699            015206  005015  052123  051101  MKBJ:   .ASCII  <15><12>/START WITH THE 2ND ROW/<15><12><377>
                015214  020124  044527  044124
                015222  052040  042510  031040
                015230  042116  051040  053517
                015236  005015     377
1700            015241     015  051412  040524  MKBK:   .ASCII  <15><12>/START  WITH THE 3RD ROW/<15><12><377>
                015246  052122  052040  044527
                015254  044124  052040  042510
                015262  031440  042122  0E1040
                015270  053517  005015     377
1701            015275     015  051412  040524  MKBL:   .ASCII  <15><12>/START WITH THE 4TH ROW/<15><12><377>
                015303  052122  053440  052111
                015310  020110  044124  020105
                015316  052064  020110  047522
                015324  006527  177412
1702            015330  005015  052123  051101  MKBM:   .ASCII  <15><12>/START WITH THE LAST ROW/<15><12><377>
                015336  020124  044527  044124
                015344  052040  042510  046040
                015352  051501  020124  047522
                015360  006527  177412
1703            015364  005015  053012  032524  MKBN:   .ASCII  <15><12><12>/VT50H KEYPAD TEST/<15><12><377>
                015372  044040  045440  054505
                015400  040520  020104  042524
                015406  052123  005015     377
1704            015413     015  053012  032524  MKB52:  .ASCII  <15><12>/VT52 ALTERNATE KEYPAD MODE TEST/<15><12><377>
                015420  020040  046101  042524
                015426  047122  052101  020105
                015434  042513  050131  042101
                015442  046440  042117  020105
                015450  042524  052123  005015
                015456     377
1705            015457     015  041412  040510  MKBQ:   .ASCII  <15><12>/CHARACTER WAS IN ERROR/<15><12>
                015464  040522  052103  051105
                015472  053440  051501  044440
                015500  020116  051105  047522
                015506  006522     012
1706            015511     107  047517  020104          .ASCII  /GOOD = /
                015516  020075
1707            015520     040     040     075  MKBQ1:  .BYTE   40,40,75,40
                015523     040
1708            015524     040     040     040  MKBQA:  .BYTE   40,40,40,40,40
                015527     040     040
1709            015531     102  042101  036440          .ASCII  /BAD = /
                015536     040
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 1710  015537  040  040  075  MKB02:  .BYTE   40,40,75,40
       015540  040
 1711  015541  040  040  040  MKB08:  .BYTE   40,40,40,15,12,377,0
       015544  015  012  377
       015547  000
 1712  015550  005015 042513 041131 MKBR:   .ASCIZ  <15><12>/KEYBOARD CHARACTER TEST COMPLETE/<15><12><377>
       015556  040517 042122 041440
       015564  040510 040522 052103
       015572  051105 052040 051505
       015600  020124 047503 050115
       015606  042514 042524 005015
       015614  000377
 1713
 1714  015620  005015 045440 054505 MKE:    .ASCII  <15><12>/ KEYBOARD ASCII AND OCTAL LOOP/<15><12>
       015626  047502 051101 020104
       015634  051501 044503 020111
       015642  047101 020104 041517
       015650  040524 020114 047514
       015656  050117 005015
 1715  015662  015  012                    .BYTE   15,12
 1716  015664  044127 047105 040440       .ASCII  /WHEN A KEY IS DEPRESSED, THE ASCII CHARACTER AND/
       015672  045440 054505 044440
       015700  020123 042504 051120
       015706  051505 042523 026104
       015714  052040 042510 040440
       015722  041523 044511 041440
       015730  040510 040522 052103
       015736  051105 040440 042116
 1717  015744  015  012                    .BYTE   15,12
 1718  015746  052040 042510 052040       .ASCIZ  / THE THREE DIGIT OCTAL CODE WILL BE ECHOED/
       015754  051110 042505 042040
       015762  043511 052111 047440
       015770  052103 046101 041440
       015776  042117 020105 044527
       016004  046114 041040 020105
       016012  041505 047510 042105
       016020  000
 1719  016021  015  012  377                .BYTE   15,12,377,0
       016024  000
 1720  016025  015  041412 040510 MKEA:   .ASCII  <15><12>/CHAR = /
       016032  020122 020075
 1721  016036  040  040  040  MKEA1:  .BYTE   40,40,40,75,40
       016041  075  040
 1722  016043  040  040  040  MKEB:   .BYTE   40,40,40,15,12,377,0
       016046  015  012  377
       016051  000
 1723  016052  005015 042513 041131 MKEH:   .ASCIZ  <15><12>/KEYBOARD ECHO LOOP/<15><12>
       016060  040517 042122 042440
       016066  044103 020117 047514
       016074  050117 005015 000
 1724  016101  015  012  012  CRLF:   .BYTE   15,12,12,12,12,12,12,12,12
       016104  012  012  012
       016107  012  012  012
 1725  016112  012  012  012  CRLFA:  .BYTE   12,12,12,12,12,377,0
       016115  012  012  377
       016120  000
```

```
1726                                      ;HOME AND ERASE SCREEN OPCODE
1727  016121     033     110     033     HOMERS: .BYTE   33,110,33,112,377,0
      016124     112     377     000
1728  016127     015  052012  040040     PATH:   .ASCII  <15><12>/T @@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@/
      016134  040100  040100  040100
      016142  040100  040100  040100
      016150  040100  040100  040100
      016156  040100  040100  040100
      016164  040100  040100  040100
      016172  040100  040100  040100
      016200     100
1729  016201     100  040100  040100             .ASCII  /@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@ T/
      016206  040100  040100  040100
      016214  040100  040100  040100
      016222  040100  040100  040100
      016230  040100  040100  040100
      016236  040100  040100  040100
      016244  040100  020100     124
1730  016251     015  052012  042440             .ASCII  <15><12>/T EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE/
      016256  042505  042505  042505
      016264  042505  042505  042505
      016272  042505  042505  042505
      016300  042505  042505  042505
      016306  042505  042505  042505
      016314  042505  042505  042505
      016322     105
1731  016323     105  042505  042505             .ASCII  /EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE T/
      016330  042505  042505  042505
      016336  042505  042505  042505
      016344  042505  042505  042505
      016352  042505  042505  042505
      016360  042505  042505  042505
      016366  042505  020105     124
1732  016373     377     000     000             .BYTE   377,0,0
1733  016376  005015  042524  052123     VT50A:  .ASCII  <15><12>/TESTING VT50A (12 LINES-NO COPIER)/
      016404  047111  020107  052126
      016412  030065  020101  030450
      016420  020062  044514  042516
      016426  026523  047516  041440
      016434  050117  042511  024522
1734  016442     015     012     012             .BYTE   15,12,12,377,0,0
      016445     377     000     000
1735  016450  005015  042524  052123     VT50B:  .ASCII  <15><12>/TESTING VT50B (12 LINES-COPIER)/
      016456  047111  020107  052126
      016464  030065  020102  030450
      016472  020062  044514  042516
      016500  026523  047503  044520
      016506  051105     051
1736  016511     015     012     012             .BYTE   15,12,12,377,0,0
      016514     377     000     000
1737  016517     015  052012  051505     VT55:   .ASCII  <15><12>/TESTING VT55 (24 LINES-COPIER)/
      016524  044524  043516  053040
      016532  032524  020065  031050
      016540  020064  044514  042516
      016546  026523  047503  044520
      016554  051105     051
```

```
1738  016557  015     012     012          .BYTE   15,12,12,377,0,0
      016562  377     000     000
1739  016565  015     052012  051505 VTSOH: .ASCII  <15><12>/TESTING VTSOH (12 LINES-COPIER-D.C.A.)/
      016572  044524  043516  053040
      016600  032524  044060  024040
      016606  031061  046040  047111
      016614  051505  041454  050117
      016622  042511  026522  027104
      016630  027103  027101  000051
1740  016636  015     012     012          .BYTE   15,12,12,377,0,0
      016642  377     000     000
1741  016645  015     052012  051505 VT52K: .ASCII  <15><12>/TESTING VT52 (24 LINES-NO COPIER OR PRINTER/
      016652  044524  043516  053040
      016660  032524  020062  031050
      016666  020064  044514  042516
      016674  026523  047516  041440
      016702  050117  042511  020122
      016710  051117  050040  044522
      016716  052116  051105
1742  016722  015     012     012          .BYTE   15,12,12,377,0,0
      016725  377     000     000
1743  016730  005015  042524  052123 VT52L: .ASCII  <15><12>/TESTING VT52 (24 LINES,COPIER-NO PRINTER)/
      016736  047111  020107  052126
      016744  031065  024040  032062
      016752  046040  047111  051505
      016760  041454  050117  042511
      016766  026522  047516  050040
      016774  044522  052116  051105
      017002  051
1744  017003  015     012     012          .BYTE   15,12,12,377,0,0
      017006  377     000     000
1745  017011  015     052012  051505 VT52M: .ASCII  <15><12>/TESTING VT52 (24 LINES,PRINTER-NO COPIER)/
      017016  044524  043516  053040
      017024  032524  020062  031050
      017032  020064  044514  042516
      017040  026123  051120  047111
      017046  042524  026522  047516
      017054  041440  050117  042511
      017062  024522
1746  017064  015     012     012          .BYTE   15,12,12,377,0,0
      017067  377     000     000
1747  017072  033     132     377 RFI:     .BYTE   33,132,377,0,0
      017075  000     000
1748  017077  033     015534  006537 MQ0:   .ASCIZ  <33><134><33><137><15><12><12>/LOOP ON TEST PATTERN LETTER (A THRU Z) ?
      017104  005012  047514  050117
      017112  047440  020116  042524
      017120  052123  050040  052101
      017126  042524  047122  046040
      017134  052105  042524  020122
      017142  040450  052040  051110
      017150  020125  024532  037440
      017156  036440  020040  000377
1749  017164  056033  057433  005015 MQ1:   .ASCIZ  <33><134><33><137><15><12><12>/START AT TEST PATTERN LETTER (A THRU Z) ?
      017172  051412  040524  052122
      017200  040440  020124  042524
      017206  052123  050040  052101
```

```
                017212  042524  047122  046040
                017220  052105  042524  020122
                017226  040440  052040  051110
                017234  020122  024532  037440
                017242  036440  020040  000377
1750            017250  005015  052012  054522  MQ2:    .ASCIZ  <15><12><12>/TRY AGAIN /<15><12><377>
                017256  040440  040507  047111
                017264  006440  177412     000
1751            017271     033     135     012  GOPRNT: .BYTE   33,135,12,12,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0377,0,0
                017274     012     000     000
                017277     000     000     000
                017302     000     000     000
                017305     000     000     000
                017310     000     000     000
                017313     000     377     000
                017316     000
1752            017317     033  006533  052012  GOHDSC: .ASCIZ  <33><133><15><12>/TESTING SILO REG/<377>
                017324  051505  044524  043516
                017332  051440  046111  020117
                017340  042522  177507     000
1753            017345     033  006534  051412  GODSHS: .ASCIZ  <33><134><15><12>/SILO TEST DONE/<15><12><377>
                017352  046111  020117  042524
                017360  052123  042040  047117
                017366  006505  177412     000
1754            017373     033     136     377  GOAPMD: .BYTE   33,136,377,0,0
                017376     000     000
1755            017400     033     137     015  GONAPM: .BYTE   33,137,15,12,12,12,0,0,0,0,0,0,0,0,0,0,0,0,377,0,0,0,0
                017403     012     012     012
                017406     000     000     000
                017411     000     000     000
                017414     000     000     000
                017417     000     000     000
                017422     377     000     000
                017425     000     000
1756            017427     033  015510  020112  M98:    .ASCIZ  <33><110><33><112>/   DIRECT CURSOR ADDRESSING TEST/<377>
                017434  020040  044504  042522
                017442  052103  041440  051125
                017450  047523  020122  042101
                017456  051104  051505  044523
                017464  043516  052040  051505
                017472  177524     000
1757            017475     015  005012  044506  WHAT0:  .ASCIZ  <15><12><12>/FIRST LINE DEVICE ADDRESS ? = /<200>
                017502  051522  020124  044514
                017510  042516  042040  053105
                017516  041511  020105  042101
                017524  051104  051505  020123
                017532  020077  020075  000200
1758            017540  005015  046012  051501  WHAT1:  .ASCIZ  <15><12><12>/LAST LINE DEVICE ADDRESS (CR IF NONE) ? = /<200>
                017546  020124  044514  042516
                017554  042040  053105  041511
                017562  020105  042101  051104
                017570  051505  020123  041450
                017576  020122  043111  047040
                017604  047117  024505  037440
                017612  036440  100040     000
1759            017617     015  020012  020040  PASHED: .ASCIZ  <15><12>/          PASS #    # OF ERRORS   /
```

```
                017624  020040  020040  020040
                017632  050040  051501  020123
                017640  020043  020040  021440
                017646  047440  020106  051105
                017654  047522  051522  020040
                017662  000040
1760            017664  051105  047522  020122  EM1:    .ASCIZ  /ERROR FLAG SET ON TRANSMITTER STATUS/
                017672  046106  043501  051440
                017700  052105  047440  020116
                017706  051124  047101  046523
                017714  052111  042524  020122
                017722  052123  052101  051525
                017730      000
1761            017731      116 020117  047111  EM2:    .ASCIZ  /NO INPUT FLAG DETECTED/
                017736  052520  020124  046106
                017744  043501  042040  052105
                017752  041505  042524  000104
1762            017760  047111  047503  051122  EM3:    .ASCIZ  /INCORRECT I.D. CODE/
                017766  041505  020124  027111
                017774  027104  041440  042117
                020002  000105
1763            020004  047105  054105  042520  EM4:    .ASCIZ  /UNEXPECTED OR INCORRECT INPUT CHAR/
                020012  052103  042105  047440
                020020  020122  047111  047503
                020026  051122  041505  020124
                020034  047111  052520  020124
                020042  044103  051101      000
1764            020047      111 053116  046101  EM5:    .ASCIZ  /INVALID BUSS ADDRESS, TRY AGAIN/
                020054  042111  041040  051525
                020062  020123  042101  051104
                020070  051505  026123  052040
                020076  054522  040440  040507
                020104  047111      000
1765            020107      105 051122  041520  DH1:    .ASCIZ  /ERRPC   VTNOW   TSTNUM/
                020114  020040  053040  047124
                020122  053517  020040  052040
                020130  052123  052516  000115
1766            020136  051105  050122  020103  DH3:    .ASCIZ  /ERRPC   VTNOW   1ST WD  2ND WD  3RD WD/
                020144  020040  052126  047516
                020152  020127  020040  051461
                020160  020124  042127  020040
                020166  047062  020104  042127
                020174  020040  051063  020104
                020202  042127      000
1767            020205      105 051122  041520  DH4:    .ASCIZ  /ERRPC   VTNOW   TSTNUM   EXPCT   RECV/
                020212  020040  053040  047124
                020220  053517  020040  052040
                020226  052123  052516  020115
                020234  020040  054105  041520
                020242  020124  020040  042522
                020250  053103      000
1768            020254                          .EVEN
1769            020254  001122  001244  001250  DT1:    $ERRPC,VTNOW,TSTNUM,0
                020262  000000
1770            020264  001122  001244  001326  DT3:    $ERRPC,VTNOW,SAVE4,SAVE2,SAVE3,0
                020272  001322  001324  000000
```

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 1771  020300 001122 001244 001250 DT4:    SERRPC,VTNOW,TSTNUM,SGDOAT,SBDOAT,0
       020306 001130 001132 000000
 1772
 1773                                       .SBTTL  KEYBOARD CHARACTER CODE TABLES
 1774
 1775                               ;THE ACTUAL KEYBOARD LAYOUT IS REQUIRED
 1776
 1777  020314 020350 020404 020442 VSORW:  ROW1,ROW2,ROW3,ROW4,ROW1S,ROW1S,ROW1C
       020322 020472 020672 020672
       020330 020764
 1778  020332 020520 020556 020614 VS2RW:  ROW12,ROW22,ROW32,ROW42,ROW12S,ROW12S,ROW12C
       020340 020646 020726 020726
       020346 021020
 1779
 1780
 1781  020350 000033 000061 000062 ROW1:   .WORD   33,61,62,63,64,65,66,67,70,71,60,55,75,100010
       020356 000063 000064 000065
       020364 000066 000067 000070
       020372 000071 000060 000055
       020400 000075 100010
 1782  020404 000011 000121 000127 ROW2:   .WORD   11,121,127,105,122,124,131,125,111,117,120,133,134,12,100177
       020412 000105 000122 000124
       020420 000131 000125 000111
       020426 000117 000120 000133
       020434 000134 000012 100177
 1783  020442 000101 000123 000104 ROW3:   .WORD   101,123,104,106,107,110,112,113,114,73,47,100015
       020450 000106 000107 000110
       020456 000112 000113 000114
       020464 000073 000047 100015
 1784  020472 000132 000130 000103 ROW4:   .WORD   132,130,103,126,102,116,115,54,56,100057
       020500 000126 000102 000116
       020506 000115 000054 000056
       020514 100057
 1785  020516 100040              ROW5:   .WORD   100040
 1786                               ;VT52 KEYBOARD EQUIVALENCES(LOWER CASE CHAR.)
 1787
 1788  020520 000033 000061 000062 ROW12:  .WORD   33,61,62,63,64,65,66,67,70,71,60,55,75,140,100010
       020526 000063 000064 000065
       020534 000066 000067 000070
       020542 000071 000060 000055
       020550 000075 000140 100010
 1789  020556 000011 000161 000167 ROW22:  .WORD   11,161,167,145,162,164,171,165,151,157,160,133,134,12,100177
       020564 000145 000162 000164
       020572 000171 000165 000151
       020600 000157 000160 000133
       020606 000134 000012 100177
 1790  020614 000141 000163 000144 ROW32:  .WORD   141,163,144,146,147,150,152,153,154,73,47,173,100015
       020622 000146 000147 000150
       020630 000152 000153 000154
       020636 000073 000047 000173
       020644 100015
 1791  020646 000172 000170 000143 ROW42:  .WORD   172,170,143,166,142,156,155,54,56,100057
       020654 000166 000142 000156
       020662 000155 000054 000056
       020670 100057
 1792
```

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1793                                            ;SHIFTED ROW CODES
1794
1795  020672 000033 000041 000100  ROW1S:  .WORD   33,41,100,43,44,45,136,46,52,50,51,137,53,100010
      020700 000043 000044 000045
      020706 000136 000046 000052
      020714 000050 000051 000137
      020722 000053 100010
1796  020726 000033 000041 000100  ROW12S: .WORD   33,41,100,43,44,45,136,46,52,50,51,137,53,176,100010
      020734 000043 000044 000045
      020742 000136 000046 000052
      020750 000050 000051 000137
      020756 000053 000176 100010
1797
1798                                            ;CONTROL ROW CODES
1799
1800  020764 000033 000021 000022  ROW1C:  .WORD   33,21,22,23,24,25,26,27,30,31,20,15,35,100010
      020772 000023 000024 000025
      021000 000026 000027 000030
      021006 000031 000020 000015
      021014 000035 100010
1801  021020 000033 000021 000022  ROW12C: .WORD   33,21,22,23,24,25,26,27,30,31,20,15,35,0,100010
      021026 000023 000024 000025
      021034 000026 000027 000030
      021042 000031 000020 000015
      021050 000035 000000 100010
1802                                                    ;VT52   ESCAPE SEQUENCES
1803
1804  021056  033   111   015  REVLF:  .BYTE   33,111,015,377,0        ;REVERSE LINE FEED.
      021061  377   000
1805
1806  021063  033   075   377  ENAKP:  .BYTE   33,075,377,0,0          ;ENABLE ALTERNATE KEYPAD MODE.
      021066  000   000
1807  021070  033   076   377  EXAKP:  .BYTE   33,076,377,0,0          ;EXIT ALTERNATE KEYPAD MODE
      021073  000   000
1808
1809  021075  033   106   377  ENGRAF: .BYTE   33,106,377,0,0          ;ENTER GRAPHICS MODE.
      021100  000   000
1810  021102  033   107   377  EXGRAF: .BYTE   33,107,377,0,0          ;EXIT GRAPHICS MODE.
      021105  000   000
1811
1812  021107  033   127   377  ENPNTM: .BYTE   33,127,377,0,0          ;ENABLE PRINTER CONTROLLER MODE.
      021112  000   000
1813  021114  033   130   377  EXPNTM: .BYTE   33,130,377,0,0          ;DISABLE PRINTER CONTROLLER MODE.
      021117  000   000
1814
1815
1816                                            ;VT50-H KEYPAD CODES
1817
1818        021122                              .EVEN
1819  021122 000033 000120 000033  ROW6:   .WORD   33,'P,33,'Q,33,'R,33,100101
      021130 000121 000033 000122
      021136 000033 100101
1820  021142 000067 000070 000071  ROW7:   .WORD   67,70,71,33,100102
      021150 000033 100102
1821  021154 000064 000065 000066  ROW8:   .WORD   64,65,66,33,100103
      021162 000033 100103
```

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 1822  021166  000061  000062  000063  ROW9:   .WORD   61,62,63,33,100104
       021174  000033  100104
 1823  021200  000060  000056  100015  ROW10:  .WORD   60,56,100015
 1824  021206  000033  000120  000033  ROW6A:  .WORD   33,'P,33,'Q,33,'R,33,100101
       021214  000121  000033  000122
       021222  000033  100101
 1825  021226  000033  000077  000167  ROW7A:  .WORD   33,'?,167,33,'?,170,33,'?,171,33,100102
       021234  000033  000077  000170
       021242  000033  000077  000171
       021250  000033  100102
 1826  021254  000033  000077  000164  ROW8A:  .WORD   33,'?,164,33,'?,165,33,'?,166,33,100103
       021262  000033  000077  000165
       021270  000033  000077  000166
       021276  000033  100103
 1827  021302  000033  000077  000161  ROW9A:  .WORD   33,'?,161,33,'?,162,33,'?,163,33,100104
       021310  000033  000077  000162
       021316  000033  000077  000163
       021324  000033  100104
 1828  021330  000033  000077  000160  ROW10A: .WORD   33,'?,160,33,'?,156,33,'?,100115
       021336  000033  000077  000156
       021344  000033  000077  100115
 1829  021352  005015  052012  044510  MTEXT0: .ASCIZ  <15><12><12>/THIS SOFTWARE IS FURNISHED TO PURCHASER UNDER A LICENSE FOR
       021360  020123  047523  052106
       021366  040527  042522  044440
       021374  020123  052506  047122
       021402  051511  042510  020104
       021410  047524  050040  051125
       021416  044103  051501  051105
       021424  052440  042116  051105
       021432  040440  046040  041511
       021440  047105  042523  043040
       021446  051117  052440  042523
       021454  000377
 1830  021456  005015  047117  040440  MTEXT1: .ASCIZ  <15><12>/ON A SINGLE COMPUTER SYSTEM AND CAN BE COPIED (WITH INCLUSION/<
       021464  051440  047111  046107
       021472  020105  047503  050115
       021500  052125  051105  051440
       021506  051531  042524  020115
       021514  047101  020104  040503
       021522  020116  042502  041440
       021530  050117  042511  020104
       021536  053450  052111  020110
       021544  047111  046103  051525
       021552  047511  177516     000
 1831  021557     015  047412  020106  MTEXT2: .ASCIZ  <15><12>/OF DEC'S COPYRIGHT NOTICE) ONLY FOR USE IN SUCH SYSTEM, EXCEPT/
       021564  042504  023503  020123
       021572  047503  054520  044522
       021600  044107  020124  047516
       021606  044524  042503  020051
       021614  047117  054514  043040
       021622  051117  052440  042523
       021630  044440  020116  052523
       021636  044103  051440  051531
       021644  042524  026115  042440
       021652  041530  050105  177524
       021660     000
```

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 1832  021661  000015  040412  020123  MTEXT3: .ASCIZ  <15><12>/AS MAY OTHERWISE BE PROVIDED IN WRITING BY DEC./<377>
       021666  040515  020131  052117
       021674  042510  053522  051511
       021702  020105  042502  050040
       021710  047522  044526  042504
       021716  020104  047111  053440
       021724  044522  044524  043516
       021732  041040  020131  042504
       021740  027103  000377
 1833
 1834  021744  005015  052012  042510  MTEXT4: .ASCIZ  <15><12><12>/THE INFORMATION IN THIS DOCUMENT IS SUBJECT TO CHANGE WITHO
       021752  044440  043116  051117
       021760  040515  044524  047117
       021766  044440  020116  044124
       021774  051511  042040  041517
       022002  046525  047105  020124
       022010  051511  051440  041125
       022016  042512  052103  052040
       022024  020117  044103  047101
       022032  042507  053440  052111
       022040  047510  052125  000377
 1835  022046  005015  047516  044524  MTEXT5: .ASCIZ  <15><12>/NOTICE AND SHOULD NOT BE CONSTRUED AS A COMMITMENT BY DIGITAL/<
       022054  042503  040440  042116
       022062  051440  047510  046125
       022070  020104  047516  020124
       022076  042502  041440  047117
       022104  052123  052522  042105
       022112  040440  020123  020101
       022120  047503  046515  052111
       022126  042515  052116  041040
       022134  020131  044504  044507
       022142  040524  177514  000
 1836  022147  000015  042412  052521  MTEXT6: .ASCIZ  <15><12>/EQUIPMENT CORPORATION./<377>
       022154  050111  042515  052116
       022162  041440  051117  047520
       022170  040522  044524  047117
       022176  177456  000
 1837  022201  000015  005012  042504  MTEXT7: .ASCIZ  <15><12><12>/DEC ASSUMES NO RESPONSIBILITY FOR THE USE OR RELIABILITY OF
       022206  020103  051501  052523
       022214  042515  020123  047516
       022222  051040  051505  047520
       022230  051516  041111  046111
       022236  052111  020131  047506
       022244  020122  044124  020105
       022252  051525  020105  051117
       022260  051040  046105  040511
       022266  044502  044514  054524
       022274  047440  177506  000
 1838  022301  000015  044412  051524  MTEXT8: .ASCII  <15><12>/ITS SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC./
       022306  051440  043117  053524
       022314  051101  020105  047117
       022322  042440  052521  050111
       022330  042515  052116  053440
       022336  044510  044103  044440
       022344  020123  047516  020124
       022352  052[illegible]3  050120  044514
```

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                022360  042105  041040  020131
                022366  042504  027103
 1839           022372     015     012     377          .BYTE   15,12,377,0
                022375     000
 1840                                                    .EVEN
 1841                                   ;*****************************************************************
  (1)                                   .SBTTL  TTY INPUT ROUTINE
  (1)                                   ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
  (1)                                   ;*CALL:
  (1)                                   ;*      RDCHR                           ;;INPUT A SINGLE CHARACTER FROM THE TTY
  (1)                                   ;*      RETURN HERE                     ;;CHARACTER IS ON THE STACK
  (1)                                   ;
  (1)    022376  011646                 $RDCHR: MOV     (SP),-(SP)              ;;PUSH DOWN THE PC
  (1)    022400  016666  000004  000002         MOV     4(SP),2(SP)             ;;SAVE THE PS
  (1)    022406  105777  156530         1$:     TSTB    @$TKS                   ;;WAIT FOR
  (1)    022412  100375                         BPL     1$                      ;;A CHARACTER
  (1)    022414  117766  156524  000004         MOVB    @$TKB,4(SP)             ;;READ THE TTY
  (1)    022422  042766  177600  000004         BIC     #^C<177>,4(SP)          ;;GET RID OF JUNK IF ANY
  (1)    022430  000002                         RTI                             ;;GO BACK TO USER
  (2)                                   ;*****************************************************************
  (1)                                   ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
  (1)                                   ;*CALL:
  (1)                                   ;*      RDLIN                           ;;INPUT A STRING FROM THE TTY
  (1)                                   ;*      RETURN HERE                     ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
  (1)                                   ;*                                      ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
  (1)
  (1)    022432  010346                 $RDLIN: MOV     R3,-(SP)                ;;SAVE R3
  (1)    022434  012703  022540         1$:     MOV     #$TTYIN,R3              ;;GET ADDRESS
  (1)    022440  022703  022550         2$:     CMP     #$TTYIN+8.,R3           ;;BUFFER FULL?
  (1)    022444  101405                         BLOS    4$                      ;;BR IF YES
  (1)    022446  104405                         RDCHR                           ;;GO READ ONE CHARACTER FROM THE TTY
  (1)    022450  112613                         MOVB    (SP)+,(R3)              ;;GET CHARACTER
  (1)    022452  122713  000177                 CMPB    #177,(R3)               ;;IS IT A RUBOUT
  (1)    022456  001003                         BNE     3$                      ;;SKIP IF NOT
  (1)    022460  104400  001164         4$:     TYPE    $QUES                   ;;TYPE A '?'
  (1)    022464  000763                         BR      1$                      ;;CLEAR THE BUFFER AND LOOP
  (1)    022466  111337  022536         3$:     MOVB    (R3),9$                 ;;ECHO THE CHARACTER
  (1)    022472  104400  022536                 TYPE    ,9$
  (1)    022476  122723  000015                 CMPB    #15,(R3)+               ;;CHECK FOR RETURN
  (1)    022502  001356                         BNE     2$                      ;;LOOP IF NOT RETURN
  (1)    022504  105063  177777                 CLRB    -1(R3)                  ;;CLEAR RETURN (THE 15)
  (1)    022510  104400  001166                 TYPE    $LF                     ;;TYPE A LINE FEED
  (1)    022514  012603                         MOV     (SP)+,R3                ;;RESTORE R3
  (1)    022516  011646                         MOV     (SP),-(SP)              ;;ADJUST THE STACK AND PUT ADDRESS OF THE
  (1)    022520  016666  000004  000002         MOV     4(SP),2(SP)             ;;      FIRST ASCII CHARACTER ON IT
  (1)    022526  012766  022540  000004         MOV     #$TTYIN,4(SP)
  (1)    022534  000002                         RTI                             ;;RETURN
  (1)    022536     000                 9$:     .BYTE   0                       ;;STORAGE FOR ASCII CHAR. TO TYPE
  (1)    022537     000                         .BYTE   0                       ;;TERMINATOR
  (1)    022540  000010                 $TTYIN: .BLKB   8.                      ;;RESERVE 8 BYTES FOR TTY INPUT
 1842                                   ;*****************************************************************
  (1)
  (1)                                   .SBTTL  READ AN OCTAL NUMBER FROM THE TTY
```

```
(1)
(1)                                     ;#THIS ROUTINE WILL READ AN OCTAL (ASCII) NUMBER FROM THE TTY AND
(1)                                     ;#CHANGE IT TO BINARY.
(1)                                     ;#THE INPUT CHARACTERS WILL BE CHECKED TO INSURED THEY ARE LEGAL
(1)                                     ;#OCTAL DIGITS. IF AN ILLEGAL CHARACTER IS READ A "?" WILL BE TYPED
(1)                                     ;#FOLLOWED BY A CARRIAGE RETURN-LINE FEED. THE COMPLETE NUMBER MUST
(1)                                     ;#THEN BE RETYPED. THE INPUT IS TERMINATED BY TYPING A CARRIAGE RETURN.
(1)                                     ;#CALL:
(1)                                     ;#      RDOCT                   ;;READ AN OCTAL NUMBER
(1)                                     ;#      RETURN HERE             ;;LOW ORDER BITS ARE ON TOP OF THE STACK
(1)                                     ;#                              ;;HIGH ORDER BITS ARE IN SHIOCT
(1)
(1)  022660  011646             $RDOCT: MOV     (SP),-(SP)      ;;PROVIDE SPACE FOR THE
(1)  022662  016666  000004  000002     MOV     4(SP),2(SP)     ;;INPUT NUMBER
(3)  022670  010046                     MOV     R0,-(SP)        ;;PUSH R0 ON STACK
(3)  022672  010146                     MOV     R1,-(SP)        ;;PUSH R1 ON STACK
(3)  022674  010246                     MOV     R2,-(SP)        ;;PUSH R2 ON STACK
(1)  022676  104406             1$:     RDLIN                   ;;READ AN ASCIZ LINE
(1)  022700  012600                     MOV     (SP)+,R0        ;;GET ADDRESS OF 1ST CHARACTER
(1)  022702  010067  022676             MOV     R0,5$           ;;AND SAVE IT
(1)  022706  005001                     CLR     R1              ;;CLEAR DATA WORD
(1)  022710  005002                     CLR     R2
(1)  022712  112046             2$:     MOVB    (R0)+,-(SP)     ;;PICKUP THIS CHARACTER
(1)  022714  001420                     BEQ     3$              ;;IF ZERO GET OUT
(1)  022716  122716  000060             CMPB    #'0,(SP)        ;;MAKE SURE THIS CHARACTER
(1)  022722  003026                     BGT     4$              ;;IS AN OCTAL DIGIT
(1)  022724  122716  000067             CMPB    #'7,(SP)
(1)  023000  002423                     BLT     4$
(1)  023002  006301                     ASL     R1              ;;#2
(1)  023004  006102                     ROL     R2
(1)  023006  006301                     ASL     R1              ;;#4
(1)  023010  006102                     ROL     R2
(1)  023012  006301                     ASL     R1              ;;#8
(1)  023014  006102                     ROL     R2
(1)  023016  042716  177770             BIC     #^C7,(SP)       ;;STRIP THE ASCII JUNK
(1)  023022  060116                     ADD     (SP)+,R1        ;;ADD IN THIS DIGIT
(1)  023024  000756                     BR      2$              ;;LOOP
(1)  023026  005726             3$:     TST     (SP)+           ;;CLEAN TERMINATOR FROM STACK
(1)  023030  010166  000012             MOV     R1,12(SP)       ;;SAVE THE RESULT
(1)  023034  010237  022706             MOV     R2,$HIOCT
(3)  023040  012602                     MOV     (SP)+,R2        ;;POP STACK INTO R2
(3)  023042  012601                     MOV     (SP)+,R1        ;;POP STACK INTO R1
(3)  023044  012600                     MOV     (SP)+,R0        ;;POP STACK INTO R0
(1)  023046  000002                     RTI                     ;;RETURN
(1)  023050  005726             4$:     TST     (SP)+           ;;CLEAN PARTIAL FROM STACK
(1)  023052  105010                     CLRB    (R0)            ;;SET A TERMINATOR
(1)  023054  104400                     TYPE                    ;;TYPE UP THRU THE BAD ( CR.
(1)  023056  000000             5$:     .WORD   0
(1)  023060  104400  001164             TYPE    $QUES           ;;"?" "CR" & "LF"
(1)  023064  000730                     BR      1$              ;;TRY AGAIN
(1)  023066  000000             $HIOCT: .WORD   0               ;;HIGH ORDER BITS GO HERE
1043 023070  105777  156164     $SCOPE: TSTB    @$SWR           ;TEST BIT 7
1044 023074  100003                     BPL     $SCOPE          ;NOT SET
1045 023076  005737  010742             TST     LOOP            ;TEST LOOP
1046 023102  001041                     BNE     $OVER           ;SET LOOP ON TEST
1047
```

```
1848                                    ;#################################################################
 (1)                                    
 (1)                                    .SBTTL  SCOPE HANDLER ROUTINE
 (1)                                    
 (1)                                    ;#THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS, IT WILL INCREMENT
 (1)                                    ;#AND LOAD THE TEST NUMBER(STSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
 (1)                                    ;#AND LOAD THE ERROR FLAG (SERFLG) INTO DISPLAY<15:08>
 (1)                                    ;#THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
 (1)                                    ;#SW14=1        LOOP ON TEST
 (1)                                    ;#SW08=1        LOOP ON TEST IN SWR<7:0>
 (1)                                    ;#CALL
 (1)                                    ;#      SCOPE           ;;SCOPE=IOT
 (1)                                    
 (1)  022724                            $SCOPE:
 (1)  022724  032777  040000  156146    1$:     BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
 (1)  022732  001035                            BNE     $OVER           ;;YES IF SW14=1
 (1)                                    ;#####START OF CODE FOR THE XOR TESTER#####
 (1)  022734  000416                    $XTSTR: BR      6$              ;;IF RUNNING ON THE "XOR" TESTER CHANGE
 (1)                                                                    ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
 (1)  022736  013746  000004                    MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
 (1)  022742  012737  022762  000004            MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
 (1)  022750  005737  177060                    TST     @#177060        ;;TIME OUT ON XOR?
 (1)  022754  012637  000004                    MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
 (1)  022760  000414                            BR      $SVLAD          ;;GO TO THE NEXT TEST
 (1)  022762  022626                    5$:     CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
 (1)  022764  012637  000004                    MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
 (1)  022770  000416                            BR      $OVER           ;;LOOP ON THE PRESENT TEST
 (1)  022772                            6$:;#####END OF CODE FOR THE XOR TESTER#####
 (1)  022772  032777  000400  156100            BIT     #BIT08,@SWR     ;;LOOP ON SPEC. TEST?
 (1)  023000  001404                            BEQ     $SVLAD          ;;BR IF NO
 (1)  023002  127737  156072  001106            CMPB    @SWR,STSTNM     ;;ON THE RIGHT TEST?    SWR<7:0>
 (1)  023010  001406                            BEQ     $OVER           ;;BR IF YES
 (1)  023012  105237  001106            $SVLAD: INCB    STSTNM          ;;COUNT TEST NUMBERS
 (1)  023016  011637  001112                    MOV     (SP),$LPADR     ;;SAVE SCOPE LOOP ADDRESS
 (1)  023022  105037  001107                    CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
 (1)  023026  013777  001106  156046    $OVER:  MOV     STSTNM,@#DISPLAY ;;DISPLAY TEST NUMBER
 (1)  023034  013716  001112                    MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
 (1)  023040  000002                            RTI                     ;;FIXES PS
1849                                    
1850                                    ;#################################################################
 (1)                                    
 (1)                                    .SBTTL  ERROR HANDLER ROUTINE
 (1)                                    
 (1)                                    ;#THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
 (1)                                    ;#SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
 (1)                                    ;#AND GO TO $ERRTYP ON ERROR
 (1)                                    ;#THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
 (1)                                    ;#SW15=1        HALT ON ERROR
 (1)                                    ;#SW13=1        INHIBIT ERROR TYPEOUTS
 (1)                                    ;#CALL
 (1)                                    ;#      ERROR   N       ;;ERROR=EMT AND N=ERROR ITEM NUMBER
 (1)                                    
 (1)  023042                            $ERROR:
 (2)  023042  113737  001106  001250            MOVB    $TSTNM,TSTNUM
 (1)  023050  105237  001107            7$:     INCB    $ERFLG          ;;SET THE ERROR FLAG
 (1)  023054  001775                            BEQ     7$              ;;DON'T LET THE FLAG GO TO ZERO
```

```
(1)  023056 013777 001106 156016        MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER AND ERROR FLAG
(1)  023064 005237 001116               INC     SERTTL          ;;INC THE ERROR COUNT
(1)  023070 011637 001120               MOV     (SP),SERRPC     ;;GET ADDRESS OF ERROR INSTRUCTION
(1)  023074 162737 000002 001122        SUB     #2,SERRPC
(1)  023102 117737 156014 001120        MOVB    @SERRPC,$ITEMB  ;;STRIP AND SAVE THE ERROR ITEM CODE
(1)  023110 032777 020000 155762        BIT     #BIT13,@SWR     ;;SKIP TYPEOUT IF SET
(1)  023116 001004                      BNE     20$             ;;SKIP TYPEOUTS
(1)  023120 004737 023154               JSR     PC,SERRTYP      ;;GO TO USER ERROR ROUTINE
(1)  023124 104400 001165               TYPE    ,$CRLF
(1)  023130                         20$:
(1)  023130 005777 155744           2$: TST     @SWR            ;;HALT ON ERROR
(1)  023134 100006                      BPL     3$              ;;SKIP IF CONTINUE
(1)  023136 000000                      HALT                    ;;HALT ON ERROR!
(1)  023140 022737 006726 000042        CMP     #SENDAD,@#42    ;;ACT-11 AUTO-ACCEPT?
(1)  023146 001001                      BNE     3$              ;;BRANCH IF NO
(1)  023150 000000                      HALT                    ;;YES
(1)  023152                         3$:
(1)  023152 000002                      RTI                     ;;RETURN
1851
1852                                ;#################################################################
(1)                                 
(1)                                 .SBTTL  ERROR MESSAGE TYPEOUT ROUTINE
(1)                                 
(1)                                 ;*THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE WHICH
(1)                                 ;*ERROR IS TO BE REPORTED. IT THEN OBTAINS, FROM THE "ERROR TABLE" (SERRTB),
(1)                                 ;*AND REPORTS THE APPROPRIATE INFORMATION CONCERNING THE ERROR.
(1)                                 
(1)  023154                         SERRTYP:
(1)  023154 104400 001165               TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
(1)  023160 010046                      MOV     R0,-(SP)        ;;SAVE R0
(1)  023162 005000                      CLR     R0              ;;PICKUP THE ITEM INDEX
(1)  023164 153700 001120               BISB    @#$ITEMB,R0
(1)  023170 001004                      BNE     1$              ;;IF ITEM NUMBER IS ZERO, JUST
(1)                                                             ;;TYPE THE PC OF THE ERROR
(2)  023172 013746 001122               MOV     SERRPC,-(SP)    ;;SAVE SERRPC FOR TYPEOUT
(2)                                                             ;;ERROR ADDRESS
(2)  023176 104401                      TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
(1)  023200 000426                      BR      6$              ;;GET OUT
(1)  023202 005300                  1$: DEC     R0              ;;ADJUST THE INDEX SO THAT IT WILL
(1)  023204 006300                      ASL     R0              ;;      WORK FOR THE ERROR TABLE
(1)  023206 006300                      ASL     R0
(1)  023210 006300                      ASL     R0
(1)  023212 062700 001170               ADD     #SERRTB,R0      ;;FORM TABLE POINTER
(1)  023216 012037 023226               MOV     (R0)+,2$        ;;PICKUP "ERROR MESSAGE" POINTER
(1)  023222 001404                      BEQ     3$              ;;SKIP TYPEOUT IF NO POINTER
(1)  023224 104400                      TYPE                    ;;TYPE THE "ERROR MESSAGE"
(1)  023226 000000                  2$: .WORD   0               ;;"ERROR MESSAGE" POINTER GOES HERE
(1)  023230 104400 001165               TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
(1)  023234 012037 023244           3$: MOV     (R0)+,4$        ;;PICKUP "DATA HEADER" POINTER
(1)  023240 001404                      BEQ     5$              ;;SKIP TYPEOUT IF 0
(1)  023242 104400                      TYPE                    ;;TYPE THE "DATA HEADER"
(1)  023244 000000                  4$: .WORD   0               ;;"DATA HEADER" POINTER GOES HERE
(1)  023246 104400 001165               TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
(1)  023252 011000                  5$: MOV     (R0),R0         ;;PICKUP "DATA TABLE" POINTER
(1)  023254 001004                      BNE     7$              ;;GO TYPE THE DATA
(1)  023256 012600                  6$: MOV     (SP)+,R0        ;;RESTORE R0
```

```
(1)  023260  104400  001165          TYPE    $CRLF           ;;"CARRIAGE RETURN" & "LINE FEED"
(1)  023264  000207                  RTS     PC              ;;RETURN
(2)  023266                       7$:
(2)  023266  013046                  MOV     @(R0)+,-(SP)    ;;SAVE @(R0)+ FOR TYPEOUT
(2)  023270  104401                  TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
(1)  023272  005710                  TST     (R0)            ;;IS THERE ANOTHER NUMBER?
(1)  023274  001770                  BEQ     6$              ;;BR IF NO
(1)  023276  104400  023304          TYPE    ,8$             ;;TYPE TWO(2) SPACES
(1)  023302  000771                  BR      7$              ;;LOOP
(1)  023304  020040     000      8$:     .ASCIZ  /  /            ;;TWO(2) SPACES
(1)          023310                  .EVEN
1853
1854                              ;*****************************************************************
(1)                               
(1)                               .SBTTL  TYPE ROUTINE
(1)                               
(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.
(1)                               ;#NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
(1)                               ;#NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
(1)                               ;#NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
(1)                               ;#
(1)                               ;#CALL:
(1)                               ;#1) USING A TRAP INSTRUCTION
(1)                               ;#      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
(1)                               ;#OR
(1)                               ;#      TYPE
(1)                               ;#      MESADR
(1)                               ;#
(1)                               ;#2) USING A JSR INSTRUCTION
(1)                               ;#      MOV     PS,-(SP)        ;;PUSH PROCESSOR STATUS WORD ON THE STACK
(1)                               ;#      JSR     PC,$TYPE        ;;CALL TYPE ROUTINE
(1)                               ;#      MESADDR                 ;;FIRST ADRESS OF MESSAGE
(1)                               
(1)  023310  105737  001155      $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
(1)  023314  100002                  BPL     1$              ;;BR IF YES
(1)  023316  000000                  HALT                    ;;HALT HERE IF NO TERMINAL
(1)  023320  000407                  BR      3$              ;;LEAVE
(1)  023322  010046              1$:     MOV     R0,-(SP)        ;;SAVE R0
(1)  023324  017600  000002          2$:     MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
(1)  023330  112046                  MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
(1)  023332  001005                  BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
(1)  023334  005726                  TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
(1)  023336  012600              6$:     MOV     (SP)+,R0        ;;RESTORE R0
(1)  023340  062716  000002      3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
(1)  023344  000002                  RTI                     ;;RETURN
(1)  023346  122716  000011      4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
(1)  023352  001431                  BEQ     8$
(1)  023354  122716  000200          CMPB    #TCRLF,(SP)     ;;BRANCH IF NOT <CRLF>
(1)  023360  001007                  BNE     5$
(1)  023362  005726                  TST     (SP)+           ;;POP  <CR><LF> EQUIV
(1)  023364  013746  177776          MOV     PS,-(SP)        ;;TYPE CR AND LF
(1)  023370  004737  023310          JSR     PC,$TYPE
(1)  023374  001165                  $CRLF
(1)  023376  000754                  BR      2$              ;;GET NEXT CHARACTER
(1)  023400  004737  023462      5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
```

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MAINDEC-11-DZVTC-C     MACY11 27(732)  24-AUG-76  14:41  PAGE 1-56                SEQ 0070
DZVTCC.P13     TYPE ROUTINE

   (1)  023404  123726  001154          6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
   (1)  023410  001347                          BNE     2$              ;;IF NO GO GET NEXT CHAR.
   (1)  023412  013746  001152                  MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
   (1)                                                                  ;;AND THE NULL CHAR.
   (1)  023416  105366  000001          7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
   (1)  023422  002770                          BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
   (1)  023424  004737  023462                  JSR     PC,$TYPEC       ;;GO TYPE A NULL
   (1)  023430  105337  023526                  DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
   (1)  023434  000770                          BR      7$              ;;LOOP
   (1)
   (1)                                        ;HORIZONTAL TAB PROCESSOR
   (1)
   (1)  023436  112716  000040          8$:     MOVB    #40,(SP)        ;;REPLACE TAB WITH SPACE
   (1)  023442  004737  023462          9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
   (1)  023446  132737  000007  023526          BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
   (1)  023454  001372                          BNE     9$              ;;TAB STOP
   (1)  023456  005726                          TST     (SP)+           ;;POP SPACE OFF STACK
   (1)  023460  000723                          BR      2$              ;;GET NEXT CHARACTER
   (1)  023462  105777  155460          $TYPEC: TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
   (1)  023466  100375                          BPL     $TYPEC
   (1)  023470  116677  000002  155452          MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
   (1)  023476  122766  000015  000002          CMPB    #15,2(SP)       ;;BRANCH IF
   (1)  023504  001003                          BNE     1$              ;;NOT <CR>
   (1)  023506  105037  023526                  CLRB    $CHARCNT        ;;
   (1)  023512  000406                          BR      $TYPEX          ;;EXIT
   (1)  023514  122766  000012  000002  1$:     CMPB    #12,2(SP)       ;;BRANCH IF
   (1)  023522  002002                          BGE     $TYPEX          ;;<LF>
   (1)  023524  105227                          INCB    (PC)+           ;;INC SPACE
   (1)  023526  000000                  $CHARCNT:.WORD  0               ;;COUNT
   (1)  023530  000207                  $TYPEX: RTS     PC
   (1)                                        ;;      EQUATES
   (1)          000011                        TNT=11
   (1)          000200                        TCRLF=200
   (1)
1055
1056                                          ;*****************************************************************

   (1)                                        .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE

   (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)                                     ;*STYPOC---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)  023532  017646  000000             STYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
(1)  023536  116637  000001  023755             MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
(1)  023544  112637  023757             STYPOC: MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE.
(1)  023550  062716  000002                     ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
(1)  023554  000406                             BR      STYPON
(1)  023556  112737  000001  023755     STYPOC: MOVB    #1,$OFILL       ;;SET THE ZERO FILL SWITCH
(1)  023564  112737  000006  023757             MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
(1)  023572  112737  000005  023754     STYPON: MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
(1)  023600  010346                             MOV     R3,-(SP)        ;;SAVE R3
(1)  023602  010446                             MOV     R4,-(SP)        ;;SAVE R4
(1)  023604  010546                             MOV     R5,-(SP)        ;;SAVE R5
(1)  023606  113704  023757                     MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
(1)  023612  005404                             NEG     R4
(1)  023614  062704  000006                     ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
(1)  023620  110437  023756                     MOVB    R4,$OMODE       ;;SAVE IT FOR USE
(1)  023624  113704  023755                     MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
(1)  023630  016605  000012                     MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
(1)  023634  005003                             CLR     R3              ;;CLEAR THE OUTPUT WORD
(1)  023636  006105                     1$:     ROL     R5              ;;ROTATE MSB INTO "C"
(1)  023640  000404                             BR      3$              ;;GO DO MSB
(1)  023642  006105                     2$:     ROL     R5              ;;FORM THIS DIGIT
(1)  023644  006105                             ROL     R5
(1)  023646  006105                             ROL     R5
(1)  023650  010503                             MOV     R5,R3
(1)  023652  006103                     3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
(1)  023654  105337  023756                     DECB    $OMODE          ;;TYPE THIS DIGIT?
(1)  023660  100016                             BPL     7$              ;;BR IF NO
(1)  023662  042703  177770                     BIC     #177770,R3      ;;GET RID OF JUNK
(1)  023666  001002                             BNE     4$              ;;TEST FOR 0
(1)  023670  005704                             TST     R4              ;;SUPPRESS THIS 0?
(1)  023672  001403                             BEQ     5$              ;;BR IF YES
(1)  023674  005204                     4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
(1)  023676  052703  000060                     BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
(1)  023702  052703  000040             5$:     BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
(1)  023706  110337  023752                     MOVB    R3,8$           ;;SAVE FOR TYPING
(1)  023712  104400  023752                     TYPE    ,8$             ;;GO TYPE THIS DIGIT
(1)  023716  105337  023754             7$:     DECB    $OCNT           ;;COUNT BY 1
(1)  023722  003347                             BGT     2$              ;;BR IF MORE TO DO
(1)  023724  002402                             BLT     6$              ;;BR IF DONE
(1)  023726  005204                             INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
(1)  023730  000744                             BR      2$              ;;GO DO THE LAST DIGIT
(1)  023732  012605                     6$:     MOV     (SP)+,R5        ;;RESTORE R5
(1)  023734  012604                             MOV     (SP)+,R4        ;;RESTORE R4
(1)  023736  012603                             MOV     (SP)+,R3        ;;RESTORE R3
(1)  023740  016666  000002  000004             MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
(1)  023746  012616                             MOV     (SP)+,(SP)
(1)  023750  000002                             RTI                     ;;RETURN
(1)  023752     000                     8$:     .BYTE   0               ;;STORAGE FOR ASCII DIGIT
(1)  023753     000                             .BYTE   0               ;;TERMINATOR FOR TYPE ROUTINE
(1)  023754     000                     $OCNT:  .BYTE   0               ;;OCTAL DIGIT COUNTER
(1)  023755     000                     $OFILL: .BYTE   0               ;;ZERO FILL SWITCH
```

```
   (1)  023756  000000                SOMODE: .WORD   0               ;;NUMBER OF DIGITS TO TYPE
 1857                                 ;;*****************************************************************
   (1)                                
   (1)                                .SBTTL  RANDOM NUMBER GENERATOR ROUTINE
   (1)                                
   (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)                                
   (2)  023760                        $RAND:
   (3)  023760  010046                        MOV     R0,-(SP)        ;;PUSH R0 ON STACK
   (3)  023762  010146                        MOV     R1,-(SP)        ;;PUSH R1 ON STACK
   (3)  023764  010246                        MOV     R2,-(SP)        ;;PUSH R2 ON STACK
   (3)  023766  010346                        MOV     R3,-(SP)        ;;PUSH R3 ON STACK
   (1)  023770  013700  024106                MOV     $LONUM,R0       ;;SET R0 WITH LOW
   (1)  023774  013701  024104                MOV     $HINUM,R1       ;;SET R1 WITH HIGH
   (1)  024000  012703  177771                MOV     #-7,R3          ;;SET SHIFT COUNT
   (1)  024004  005002                        CLR     R2              ;;ZERO R2
   (1)  024006  006300                1$:     ASL     R0              ;;SHIFT R0 LEFT AND
   (1)  024010  006101                        ROL     R1              ;;ROTATE CARRY INTO R1 AND
   (1)  024012  006102                        ROL     R2              ;;ROTATE CARRY INTO R2
   (1)  024014  005203                        INC     R3              ;;CHECK FOR DONE
   (1)  024016  001373                        BNE     1$              ;;CONTINUE SHIFT LOOP
   (1)  024020  063700  024106                ADD     $LONUM,R0       ;;ADD NUMBER TO MAKE X 129
   (1)  024024  005501                        ADC     R1              ;;PROPOGATE CARRY
   (1)  024026  063701  024104                ADD     $HINUM,R1       ;;ADD NUMBER TO MAKE X 129
   (1)  024032  005502                        ADC     R2              ;;PROPOGATE CARRY
   (1)  024034  062700  001057                ADD     #1057,R0        ;;ADD LOW CONSTANT
   (1)  024040  005501                        ADC     R1              ;;PROPOGATE CARRY
   (1)  024042  005502                        ADC     R2              ;;PROPOGATE CARRY
   (1)  024044  062701  047401                ADD     #47401,R1       ;;ADD HIGH CONSTANT
   (1)  024050  005502                        ADC     R2              ;;PROPOGATE CARRY
   (1)  024052  062702  000006                ADD     #6,R2           ;;ADD HIGHEST CONSTART
   (1)  024056  060200                        ADD     R2,R0           ;;REPRIME R0 WITH HIGHEST DIGIT
   (1)  024060  005501                        ADC     R1              ;;PROPOGATE CARRY
   (1)  024062  010037  024106                MOV     R0,$LONUM       ;;SAVE R0
   (1)  024066  010137  024104                MOV     R1,$HINUM       ;;SAVE R1
   (3)  024072  012603                        MOV     (SP)+,R3        ;;POP STACK INTO R3
   (3)  024074  012602                        MOV     (SP)+,R2        ;;POP STACK INTO R2
   (3)  024076  012601                        MOV     (SP)+,R1        ;;POP STACK INTO R1
   (3)  024100  012600                        MOV     (SP)+,R0        ;;POP STACK INTO R0
   (1)  024102  000207                        RTS     PC              ;;RETURN
   (1)  024104  176543                $HINUM: .WORD   176543
   (1)  024106  123456                $LONUM: .WORD   123456
 1858                                 ;;*****************************************************************
   (1)                                
   (1)                                .SBTTL  TRAP DECODER
   (1)                                
   (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)  024110  010046                    $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
(1)  024112  016600  000002                    MOV     2(SP),R0        ;;GET TRAP ADDRESS
(1)  024116  005740                            TST     -(R0)           ;;BACKUP BY 2
(1)  024120  111000                            MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
(1)  024122  006300                            ASL     R0              ;;POSITION FOR INDEXING
(1)  024124  016000  024132                    MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
(1)  024130  000200                            RTS     R0              ;;GO TO ROUTINE
(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)  024132                            $TRPAD:
(3)  024132  023310                            $TYPE   ;;CALL=TYPE     TRAP+0(104400)  TTY TYPEOUT ROUTINE
(3)  024134  023556                            $TYPOC  ;;CALL=TYPOC    TRAP+1(104401)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
(3)  024136  023532                            $TYPOS  ;;CALL=TYPOS    TRAP+2(104402)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
(3)  024140  023572                            $TYPON  ;;CALL=TYPON    TRAP+3(104403)  TYPE OCTAL NUMBER (AS PER LAST CALL)
(3)  024142  012250                            $TYPDS  ;;CALL=TYPDS    TRAP+4(104404)  TYPE DECIMAL NUMBER (WITH SIGN)
(3)  024144  022376                            $RDCHR  ;;CALL=RDCHR    TRAP+5(104405)  TTY TYPEIN CHARACTER ROUTINE
(3)  024146  022432                            $RDLIN  ;;CALL=RDLIN    TRAP+6(104406)  TTY TYPEIN STRING ROUTINE
(3)  024150  022550                            $RDOCT  ;;CALL=RDOCT    TRAP+7(104407)  READ AN OCTAL NUMBER FROM TTY
                                       ;*********************************************************************
(1)
(1)                                    .SBTTL  POWER DOWN AND UP ROUTINES
(1)
(1)                                    ;POWER DOWN ROUTINE
(1)  024152  012737  024274  000024    $PWRDN: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST UP
(1)  024160  012737  000340  000026            MOV     #340,@#PWRVEC+2 ;;PRIO:7
(3)  024166  010046                            MOV     R0,-(SP)        ;;PUSH R0 ON STACK
(3)  024170  010146                            MOV     R1,-(SP)        ;;PUSH R1 ON STACK
(3)  024172  010246                            MOV     R2,-(SP)        ;;PUSH R2 ON STACK
(3)  024174  010346                            MOV     R3,-(SP)        ;;PUSH R3 ON STACK
(3)  024176  010446                            MOV     R4,-(SP)        ;;PUSH R4 ON STACK
(3)  024200  010546                            MOV     R5,-(SP)        ;;PUSH R5 ON STACK
(1)  024202  010637  024300                    MOV     SP,$SAVR6       ;;SAVE SP
(1)  024206  012737  024220  000024            MOV     #$PWRUP,@#PWRVEC ;;SET UP VECTOR
(1)  024214  000000                            HALT
(1)  024216  000776                            BR      .-2             ;;HANG UP
(1)
(1)                                    ;POWER UP ROUTINE
(1)  024220  013706  024300            $PWRUP: MOV     $SAVR6,SP       ;;GET SP
(1)  024224  005037  024300                    CLR     $SAVR6          ;;WAIT LOOP FOR THE TTY
(1)  024230  005237  024300            1$:     INC     $SAVR6          ;;WAIT FOR THE INC
(1)  024234  001375                            BNE     1$              ;;OF WORD
(3)  024236  012605                            MOV     (SP)+,R5        ;;POP STACK INTO R5
(3)  024240  012604                            MOV     (SP)+,R4        ;;POP STACK INTO R4
(3)  024242  012603                            MOV     (SP)+,R3        ;;POP STACK INTO R3
(3)  024244  012602                            MOV     (SP)+,R2        ;;POP STACK INTO R2
(3)  024246  012601                            MOV     (SP)+,R1        ;;POP STACK INTO R1
(3)  024250  012600                            MOV     (SP)+,R0        ;;POP STACK INTO R0
(1)  024252  012737  024152  000024            MOV     #$PWRDN,@#PWRVEC ;;SET UP THE POWER DOWN VECTOR
```

```
  (1)  024260  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;PRIO:7
  (1)  024266  104400                          TYPE                    ;REPORT THE POWER FAILURE
  (1)  024270  024302                SPWRMG:   .WORD   SPOWER          ;;POWER FAIL MESSAGE POINTER
  (1)  024272  000002                          RTI
  (1)  024274  000000                SILLUP:   HALT                    ;;THE POWER UP SEQUENCE WAS STARTED
  (1)  024276  000776                          BR      .-2             ;;  BEFORE THE POWER DOWN WAS COMPLETE
  (1)  024300  000000                $SAVR6:   0                       ;;PUT THE SP HERE
  (1)  024302  005015  047520  042527 $POWER:  .ASCIZ  <15><12>"POWER"
  (1)  024310  000122
  (1)                                          .EVEN
1860   024312  000000                BUFFER:   0
1861           000001                          .END
```

DZVTCC.P13 CROSS REFERENCE TABLE -- USER SYMBOLS

```
A       007344          1069#
ADELAY  011462          174     983     1483#
ANSG    011534          155     157     196     265     273     291     312     333     421     425     429     513     554
                        584     587     606     614     683     685     692     697     710     713     729     731     733
                        738     743     758     760     772     777     782     788     801     806     817     822     825
                        830     842     847     850     855     872     878     884     891     900     902     913     920
                        926     933     936     947     997     1027    1069    1074    1077    1082    1089    1092    1097
                        1102    1108    1113    1116    1119    1124    1129    1132    1135    1139    1144    1147    1155
                        1158    1162    1166    1170    1174    1179    1181    1184    1188    1192    1196    1200    1203
                        1208    1213    1354    1357    1501#   1536    1606
ANESC   010756          1268*   1270*   1274    1350#
AXOFF   010750          681*    709*    1298*   1347#
B       007406          1081#
BEGIN   001336          15      94#
BEGIN1  001426          17      107#
BEGIN2  001436          18      109#
BEGIN3  001416          19      105#
BFCHBR  007250          1014    1052#
BFCHR   007210          1008    1014    1033#
BIT0    = 000001        12#     1548    1569
BIT00   = 000001        12#
BIT01   = 000002        12#
BIT02   = 000004        12#
BIT03   = 000010        12#
BIT04   = 000020        12#
BIT05   = 000040        12#
BIT06   = 000100        12#
BIT07   = 000200        12#
BIT08   = 000400        12#     1848
BIT09   = 001000        12#     725     1063    1072    1087    1111    1127    1142
BIT1    = 000002        12#     1546
BIT10   = 002000        12#     752     897
BIT11   = 004000        12#     213     750
BIT12   = 010000        12#     1153    1469
BIT13   = 020000        12#     384     397     601     1850
BIT14   = 040000        12#     747     1848
BIT15   = 100000        12#     678
BIT2    = 000004        12#     1543
BIT3    = 000010        12#
BIT4    = 000020        12#
BIT5    = 000040        12#
BIT6    = 000100        12#
BIT7    = 000200        12#     1545    1550    1573    1577
BIT8    = 000400        12#
BIT9    = 001000        12#
BPTVEC= 000014          12#
BUFFER  024312          338     377     432     496     522     564     608*    609*    616*    617*    626     633*    644
                        663*    664*    665*    1230    1242    1258    1406    1426    1442    1654    1860#
BUSSTR  001332          91#     97
C       007422          1086#
COPTST  005274          727     746#
CRLF    016101          422     426     684     686     1724#
CRLFA   016112          714     823     848     1725#
D       007510          1108#
DCATST  004374          610     618     622#
DDISP = 177570          12#     21
```

DZVTCC.P13 CROSS REFERENCE TABLE -- USER SYMBOLS

```
DELAY   011354          221     270     289     303     309     325     331     372     420     490     518     551     558
                        581     592     611     619     722     745     768     774     784     803     827     852     874
                        893     915     929     943     949    1457#
DH1     020107           27      33    1765#
DH3     020136           39    1766#
DH4     020205           45    1767#
DIG0    011644         1002    1527*   1530#   1585    1597
DIG1    011646         1003    1520*   1531#   1586    1598
DIG2    011650         1004    1513*   1532#   1587    1599
DISPCH  006530          882     952#
DISPLA  001102           21#   1848*   1850*
DSPCH   011070         1370    1374    1375    1379#
DSWR    = 177570         12#     21
DTPSR   011246          277     791    1426#
DTPSRA  011274         1433#   1436
DTPSRB  011252          281     794    1427#
DT1     020254           28      34    1769#
DT3     020264           40    1770#
DT4     020300           46    1771#
E       007560         1124#
EMTVEC= 000030           12#     112*
EM1     017664           26    1760#
EM2     017731           32    1761#
EM3     017760           38    1762#
EMN     020004           44    1763#
EM5     020047           50    1764#
ENAKP   021063         1182    1806#
ENGRAF  021075          734    1809#
ENPNTM  021107          903    1812#
ERRVEC= 000004           12#   1848*
EXAKP   021070         1204    1807#
EXGRAF  021102          744    1810#
EXPNTM  021114          914    1813#
F       007630         1139#
FILBFA  010246         1233#   1235
FILBFB  010232          481    1230#
FILBUF  010226          297     765     811     858     868     940    1229#   1621
FILLWC  012474          268     516     556     779     923    1620#
FINDOT  010770         1320    1356#   1360
FINDTA  011000         1316*   1334*   1358#
FIRLST  011152          863    1406#
FIRST   001240           54#    125*    126     128     137
FNDA    010762         1354#   1363    1365    1371
GBBUF   011312          736    1442#
GENER   004460          635#    639     641     662     669
GENRX   004544          646     650#    654     656
GETCHR  012536          160     163     166     999    1216    1359    1539    1632#
GIN     001444          104     106     108     110#
GINA    001452          100     111#
GNS     = ****** U       15    1858
GOAPMD  017373          761     936    1754#
GODSHS  017345          711    1753#
GOHDSC  017317          698    1752#
GONAPM  017400          773     948    1755#
GOPRNT  017271          783     802     818     826     843     851     873     892     927    1751#
GRPHST  005200          726     728#
```

```
HOMERS  016121            730    1727#
IGNORE  010760            113*   1026*  1285   1319*  1322   1340*  1351#
IOTVEC= 000020             12#    112*   115*
KRBDON  010156           1154    1178   1208#
KRBECH  010172            105    1212#
KRBECO  007022            109     996#
KRBTST  007316            107    1063#  1210
LAST    001242             56#    129*   133*   134    983
LASTCH  001306             80#    212*   215*   306    328    820    845    911    1248
LASTLN  001260             69#    201*   206*   640
LBMT    002706           338#
LBMT1   003056           356     371#
LCH     003066           376#
LIC     010262           318     835    906    1242#
LICA    010300          1246#   1252
LICB    010316          1249    1251#
LOOERL  003730           522#
LOOERS  004106           562#
LOOP    010742           114*   1315*  1333*  1344#  1845
LRL     003350           432#
LTAB    003620           448     452    456    460    464    468    472    495#
MANFU   001376            20     101#
MASK1   012244          1541*   1545*  1553   1613#
MASK2   012246          1542*   1550*  1552   1573*  1577*  1594   1614#
MKB     014005          1070    1682#
MKBA    014074          1537    1684#
MKBB    014163          1078    1117   1133   1148   1685#
MKBB2   014300          1075    1114   1130   1145   1687#
MKBC    014363          1083    1688#
MKBD    014422          1093    1689#
MKBD2   014527          1090    1691#
MKBE    014615          1098    1692#
MKBF    014736          1103    1694#
MKBG    014773          1109    1695#
MKBGA   015042          1125    1696#
MKBH    015112          1140    1697#
MKBI    015153          1159    1185   1698#
MKBJ    015206          1163    1189   1699#
MKBK    015241          1167    1193   1700#
MKBL    015275          1171    1197   1701#
MKBM    015330          1175    1201   1702#
MKBN    015364          1156    1703#
MKBQ    015457          1607    1705#
MKBQA   015524          1597*   1598*  1599*  1708#
MKBQB   015543          1585*   1586*  1587*  1711#
MKBQ1   015520          1601*   1707#
MKBQ2   015537          1592*   1710#
MKBR    015552          1209    1712#
MKBS1   014041          1120    1136   1683#
MKBS2   015413          1180    1704#
MKE     015620           998    1714#
MKEA    016025          1028    1720#
MKEA1   016036          1015*   1016*  1021*  1022*  1024*  1025*  1721#
MKEB    016043          1002*   1003*  1004*  1722#
MKEH    016052          1214    1723#
MOVDN1  003022           342     359#   362
```

DZVTCC.P13 CROSS REFERENCE TABLE -- USER SYMBOLS

MOVDMN 003016 349 358#
MOVRIG 003040 343 345 346 350 352 353 365#
MPTCNT 013644 901 1679#
MPTSCN 013713 921 1680#
M00 017075 1316 1748#
M01 017162 1334 1358 1749#
M02 017250 1355 1750#
MSCOPE 022710 115 1843#
MSGTNO 005010 623 678#
MSGTXT 004670 627 676#
MSGTYP 002350 194 251#
MTEXT0 021352 885 952 1829#
MTEXT1 021456 953 1830#
MTEXT2 021557 954 1831#
MTEXT3 021661 955 1832#
MTEXT4 021744 956 1834#
MTEXT5 022046 957 1835#
MTEXT6 022147 958 1836#
MTEXT7 022201 959 1837#
MTEXT8 022301 960 1838#
MTO8 012614 1502 1653#
M91 012731 266 778 1664#
M910 013222 514 1670#
M911 013253 555 1671#
M912 013306 585 1672#
M914 013342 156 1673#
M92 012777 274 789 1665#
M920 013407 856 1674#
M921 013437 879 1675#
M922 013473 693 1676#
M9221 013530 732 1677#
M923 013605 759 1678#
M923A 013750 934 1681#
M93 013026 292 807 1666#
M94 013070 313 831 1667#
M96 013121 334 1668#
M97 013154 430 1669#
M98 017427 607 615 1756#
NOMEOP 006762 983 984#
OCTAL 011554 1001 1510# 1584 1596
OVRAL 004666 624* 668* 675#
PASHED 017617 983 1759#
PATH 016127 588 1728#
PC =%000007 12# 160* 163* 166* 174* 221* 268* 270* 285* 289* 297* 299* 303*
309* 321* 325* 331* 342* 343* 345* 346* 349* 350* 352* 353* 363*
369* 371* 372* 419* 420* 446* 450* 454* 458* 462* 466* 470* 474*
481* 489* 490* 516* 518* 549* 551* 556* 558* 580* 581* 592* 610*
611* 618* 619* 667* 670* 722* 736* 737* 745* 765* 767* 768* 774*
779* 784* 797* 803* 811* 812* 827* 837* 852* 858* 859* 860* 863*
864* 868* 869* 870* 874* 893* 909* 915* 923* 929* 940* 942* 943*
949* 983* 999* 1001* 1079* 1084* 1094* 1099* 1104* 1118* 1134* 1149* 1160*
1164* 1168* 1172* 1176* 1186* 1190* 1194* 1198* 1202* 1216* 1237* 1342* 1359*
1422* 1453* 1478* 1494* 1504* 1528* 1539* 1558* 1584* 1596* 1621* 1624* 1627*
1639* 1646* 1850* 1852* 1854* 1857*
PIRQ = 177772 12#
PIRQVE= 000240 12#

```
PNTWID   001314        83#     907
PRNTST   006254        749     894#
PRTCNT   001272        74#     99*     102*    754     756*    904     906*
PR0    = 000000        12#
PR1    = 000040        12#
PR2    = 000100        12#
PR3    = 000140        12#
PR4    = 000200        12#
PR5    = 000240        12#
PR6    = 000300        12#
PR7    = 000340        12#
PS     = 177776        12#     112*    1854
PSW    = 177776        12#
PTCT     001246        58#     756
PWRVEC=  000024        12#     112*    1859*
RBEGIN   001402        16      102#
RDCHR  = 104405        1841    1858#
RDLIN  = 104406        1842    1858#
RDOCT  = 104407        124     132     1858#
RESVEC=  000010        12#
REVLF    021056        739     1804#
RFI      017070        158     1747#
ROW1     020350        1777    1781#
ROW1C    020764        1777    1800#
ROW1S    020672        1777    1795#
ROW10    021200        1173    1823#
ROW10A   021330        1199    1828#
ROW12    020520        1778    1788#
ROW12C   021020        1778    1801#
ROW12S   020726        1778    1796#
ROW2     020404        1777    1782#
ROW22    020556        1778    1789#
ROW3     020442        1777    1783#
ROW32    020614        1778    1790#
ROW4     020472        1777    1784#
ROW42    020646        1778    1791#
ROW5     020516        1101    1785#
ROW6     021122        1157    1819#
ROW6A    021206        1183    1824#
ROW7     021142        1161    1820#
ROW7A    021226        1187    1825#
ROW8     021154        1165    1821#
ROW8A    021254        1191    1826#
ROW9     021166        1169    1822#
ROW9A    021302        1195    1827#
RSTRT    001724        139#    983
R0     =%000000        12#     139*    141*    143*    145*    147*    162     165     168     182*    183     185     186
                       189*    193     194     338*    339*    344*    347*    348*    351*    354*    357*    359*    360*
                       366*    377*    378*    379*    382*    386*    387*    391*    394*    395*    399*    400*    404*
                       407*    408*    410*    411*    414*    415*    416*    417*    418*    432*    433*    436*    437*
                       442*    443*    444*    483*    484*    485*    488*    500*    503*    522*    523*    524*    527*
                       528*    538*    539*    542*    546*    564*    565*    569*    570*    573*    574*    576*    626*
                       628*    636*    651*    983*    1005*   1007*   1009    1018    1020*   1021    1025    1218    1230*
                       1231*   1232*   1233*   1236*   1242*   1244*   1245*   1253*   1258*   1361*   1362    1364    1366*
                       1367*   1368    1369*   1370    1374    1375    1406*   1407*   1408*   1409*   1410*   1411*   1415*
                       1418*   1419*   1420*   1421*   1426*   1431*   1432*   1437*   1442*   1445*   1452*   1510    1514
```

```
                          1521    1553#   1554    1583    1588#   1589    1591#   1592    1593#   1594#   1595    1600#   1601
                          1616#   1637#   1653#   1655    1842#   1852#   1854#   1857#   1858#   1859#
R1      =%000001            12#    140#    141     142     143     144     145     146     147     296#    317#    340#    341#
                           358#    361#    365#    367#    376#    380#    383#    388#    392#    396#    401#    405#    409#
                           412#    434#    440#    480#    482#    486#    497#    506#    627#    628     629     764#    810#
                           834#    857#    867#    905#    939#   1008#   1009    1011    1014#   1015    1016    1233    1246
                          1247#   1248    1250#   1264#   1266    1271    1427#   1433    1443#   1445    1446#   1447    1449#
                          1510#   1511#   1512#   1513    1514#   1515#   1516#   1517#   1518#   1519#   1520    1521#   1522#
                          1523#   1524#   1525#   1526#   1527    1616#   1620#   1654#   1655#   1842#   1857#   1859#
R2      =%000002            12#    435#    438#    477#    478#    479#    496#    498#    499#    502#    505#    508#    509#
                           510#   1071#   1081#   1086#   1096#   1101#   1110#   1126#   1141#   1157#   1161#   1165#   1169#
                          1173#   1183#   1187#   1191#   1195#   1199#   1229#   1234#   1243#   1251#   1412#   1413#   1414#
                          1416#   1428#   1434    1444#   1450#   1551    1556    1563    1593    1616#   1842#   1857#   1859#
R3      =%000003            12#   1065#   1067#   1071    1081    1086    1096    1110    1126    1141    1429#   1430#   1435#
                          1616#   1841#   1856#   1857#   1859#
R4      =%000004            12#    728#    740#    881#    882     886    1444    1856#   1859#
R5      =%000005            12#    155#    157#    196#    265#    273#    277#    281#    291#    312#    318#    333#    421#
                           425#    429#    440#    452#    456#    460#    464#    468#    472#    495     511#    513#    554#
                           584#    587#    606#    614#    683#    685#    692#    697#    710#    713#    729#    731#    733#
                           738#    743#    750#    760#    772#    777#    782#    788#    791#    794#    801#    806#    817#
                           822#    825#    830#    835#    842#    847#    850#    855#    872#    878#    884#    891#    900#
                           902#    906#    913#    920#    926#    933#    935#    947#    997#   1027#   1069#   1074#   1077#
                          1082#   1089#   1092#   1097#   1102#   1108#   1113#   1116#   1119#   1124#   1129#   1132#   1136#
                          1139#   1144#   1147#   1155#   1158#   1162#   1166#   1170#   1174#   1179#   1181#   1184#   1188#
                          1192#   1196#   1200#   1203#   1208#   1213#   1254#   1354#   1357#   1438#   1501    1502#   1505#
                          1536#   1606#   1616#   1653    1657#   1856#   1859#
R6      =%000006            12#    112#
R7      =%000007            12#
SAVE1     001320            85#    495#    500
SAVE2     001322            86#    165#    170#    177    1770
SAVE3     001324            87#    168#    171#    183    1770
SAVE4     001326            88#     95#    110#    116     162#    169#    175    1770
SBEGIN    001716           117     121     137#    991
SET       004664           625#    631#    644#    647#    659#    660     674#
SP      =%000006            12#     91     112#    125     133     983#    988#    996#   1068#   1212#   1356#   1616#   1638#
                          1841#   1842#   1848#   1850    1852#   1854#   1856#   1857#   1858#   1859#
STACK   = 001100            12#    112     996    1068    1212    1356
STCHAR    001304            79#    293#    296     305#    306     314#    317     327#    328     808#    810     819#    [illegible]
                           832#    834     844#    845     904#    905     910#    911

STKLMT= 177774              12#
SUBTST    001254            62#   1457    1483
SWR       001100            21#    120     750     752    1304    1469    1543    1546    1548    1569    1843    1848    1850
SW0     = 000001            12#
SW00    = 000001            12#
SW01    = 000002            12#
SW02    = 000004            12#
SW03    = 000010            12#
SW04    = 000020            12#
SW05    = 000040            12#
SW06    = 000100            12#
SW07    = 000200            12#
SW08    = 000400            12#
SW09    = 001000            12#
SW1     = 000002            12#
SW10    = 002000            12#
SW11    = 004000            12#
```

```
SW12    = 010000            12#
SW13    = 020000            12#
SW14    = 040000            12#
SW15    = 100000            12#
SW2     = 000004            12#
SW3     = 000010            12#
SW4     = 000020            12#
SW5     = 000040            12#
SW6     = 000100            12#
SW7     = 000200            12#
SW8     = 000400            12#
SW9     = 001000            12#
TBITVE= 000014              12#
TCRLF   = 000200          1854#
TEMP    001310             81#   275#   286#   586#   590#   790#   798#   861#   862#   865#
TEMP0   001312             82#   296#   301#   304#   316#   323#   326#   735#   741#   763#   769#   809#   813#
                           815#   833#   838#   840#   938#   944#
THT     = 000011          1854#
TIMED   001252             61#  1276   1632
TIME1   012610           1276#  1282#  1632#  1643#  1648#
TIME2   012612           1277#  1280#  1633#  1641#  1649#
TITLE   012630            119   1663#
TKVEC   = 000060            12#
TOTALC  001262             70#   199#   204#   624
TPVEC   = 000064            12#
TRSPVE= 000034              12#   112#
TRTVEC= 000014              12#
TSTNUM  001250             53#  1769   1771   1850#
TSTROW  011652           1079   1084   1094   1099   1104   1118   1134   1149   1160   1164   1168   1172   1176
                         1186   1190   1194   1198   1202   1538#
TST1    001760             61    103    149    154#   983    987   1379
TST10   003710            491    512#  1386
TST11   004066            553#  1387
TST12   004214            563#  1388
TST13   004362            594#  1389
TST14   005012            603    640#  1390
TST15   005162            669    691    724#  1391
TST16   005274            746#  1392
TST17   005444            776#  1393
TST2    002400            222    263#  1380
TST20   005500            787#  1394
TST21   005570            805#  1395
TST22   005722            828#  1396
TST23   006066            854#  1397
TST24   006200            876#  1398
TST25   006336            896#  1399
TST26   006370            917#  1400
TST27   006434            931#  1401
TST3    002460            272#  1381
TST30   007020            985#  1402
TST31   007314           1062#  1403
TST32   010170           1211#
TST4    002474            290#  1382
TST5    002574            311#  1383
TST6    002676            332#  1384
TST7    003340            424    428#  1385
```

DZVTCC.P13 CROSS REFERENCE TABLE -- USER SYMBOLS

```
TYPDS = 104404          983     989    1858#
TYPE  = 104400          118     122     130     983     990    1616    1841    1842    1850    1852    1856    1858#   1859
TYPEPT  002316          183     186     193    2358
TYPOC = 104401         1852    1858#
TYPON = 104403         1858#
TYPOS = 104402         1858#
VH0     001264           71#    200#    205#    208     295     304     316     326     525     568     625     763     809
                        815     833     840     938    1622
VH1     001266           72#    208#    209#    210     275     340     358     376     396     586     790     861    1413
VH2     001270           73#    210#    211#
VTIB    001276           76#   1267    1637
VTIS    001274           75#    139    1272    1278    1603    1635
VTNOW   001244           57#    137#    140     983#   1769    1770    1771
VTOB    001302           78#   1218#   1271#
VTOS    001300           77#   1219    1259    1261
VTSCX   001256           68#    193#    202     213     384     397     423     532     601     612     690     725     747
                         897    1063    1072    1087    1111    1127    1142    1153    1177
VT50A   016376          197     251    1733#
VT50B   016450          262    1735#
VT50H   016564          354    1739#
VT52X   016643          395    1741#
VT52L   016726          436    1743#
VT52M   017007          457    1745#
VT5S    016517          263    1737#
V50RM   020314         1067    1777#
V52RM   020332         1065    1778#
WFTEST  001330           89#     96#    101#    172     604     688     983    1459
WHATO   017475          123    1757#
WHAT1   017540          131    1758#
WHERE   001756           94#    103#    105#    107#    109#    148     149#    983#    987#
WIDTH   001316           84#    319     477     482     562     836    1229    1412    1429
XADDS   004662          657#    664     673#
XOFF  = 000023           64#   1293
XOFFBR  010744          696#    708#   1299    1317#   1341#   1345#
XOFFOK  010746          695#    766#    771#    781#    800#    816#    824#    841#    849#    871#    890#    908#    925#
                        941#    946#   1296    1318#   1339#   1346#   1623#
XOFFRC  010752          682#    700    1295#   1348#
XON   = 000021           65#   1289
XONRC   010754          707#    716    1291#   1349#
XPRNT   010330          285     298     321     371     419     446     450     454     458     462     466     470     474
                        489     549     580     667     737     767     797     812     837     859     860     864     869
                        870     909     942    1258#   1504    1624
XPRNTA  010334         1259#   1262    1273    1275    1292    1300    1329
XPRNTB  010352         1260    1264#
YADDS   004660          642#    663     672#
$BDADR  001126           21#
$BDDAT  001132           21#    112    1287#   1288#   1289    1293    1307    1310    1583#   1771
$CHARC  023526         1854#*
$CHTAG  001104           21#    112
$CH1  = 000002           21#
$CH2  = 000004           21#
$CH3  = 000002           21#
$CRLF   001166           21#   1841    1842    1850    1852    1854
$DBLK   012464         1616#
$DISPL  001140           21#
$DDARGN 006736          983#
```

```
MAINDEC-11-DZVTC-C     MACY11 27(732)  24-AUG-76  14:41  PAGE 2-8                SEQ 0083
DZVTCC.P13      CROSS REFERENCE TABLE -- USER SYMBOLS

$DTBL   012454          1616#
$ENDAD  006726           983#  1850
$ENDCT  006674           112    983#
$ENDMG  006742           983#
$ENULL  006757           983#   990
$EOP    006656           699    951    983#
$EOPCT  006672           112*   983#
$ERFLG  001107            21#  1848*  1850*
$ERMAX  001121            21#  1848
$ERROR  023042           112   1850#
$ERRPC  001122            21#  1769   1770   1771   1850*  1852
$ERRTB  001120            21#  1852
$ERRTY  023154          1850   1852#
$ERTTL  001116            21#   988   1850*
$FILLC  001154            21#  1854
$FILLS  001153            21#  1854
$GOROR  001124            21#
$GODAT  001130            21#  1302*  1306*  1307   1309*  1310   1595*  1771
$ET42   006716           983#
$HO   = 000000            11
$HINUM  024104           623*  1857#*
$HIOCT  022706          1842#*
$ICNT   001110            21#
$ILLUP  024274          1859#
$ITEMB  001120            21#  1850*  1852
$LF     001166            21#  1841   1842   1850   1854
$LONUM  024106           622*   636    651   1857#*
$LPADR  001112            21#   112*  1374*  1848*
$LPERR  001114            21#
$MAIL = ****** U          112    154    263    272    290    311    332    428    512    553    583    594    680
                          724    746    776    787    805    829    854    876    896    917    931    995   1062
                         1211   1848   1850   1854
$NULL   001152            21#  1854
$NWTST= 000001           154#   263#   272#   290#   311#   332#   428#   512#   553#   583#   594#   680#   724#
                         746#   776#   787#   805#   829#   854#   876#   896#   917#   931#   995#  1062#  1211#
$OCNT   023754          1856#*
$OMODE  023756          1856#*
$OVER   023026          1846   1848#
$PASS   001104            21#   983*
$POWER  024302          1859#
$PWRDN  024152           112   1859#
$PWRNG  024270          1859#
$PWRUP  024220          1859#
!QUES   001164            21#  1841   1842   1850
!RAND   023760           635    650   1857#
!ROCHR  022376          1841#  1858
!RODEC= ****** U        1858
!ROLIN  022432          1841#  1858
!ROOCT  022550          1842#  1858
!ROSZ = 000010          1841#
$REG0D  001156            21#
$REG0   001160            21#
$REG1   001162            21#
$R29  = ****** U        1858
$SAVRE= ****** U        1858
$SAVR6  024300          1859#*
```

DZVTCC.P13 CROSS REFERENCE TABLE -- USER SYMBOLS

```
$SCOPE  022724          112   1844   1848#
$SETUP= 000037           23#   112    983   1850
$STUP = 177777           23#
$SVLAD  023012         1848#
$SWR  = 160400            5#    11     14     21    112    154    263    272    290    311    332    420    512
                        553    583    594    680    724    746    776    787    805    824    854    876    896
                        917    931    983    995   1062   1211   1848   1850   1859
$SWREG  001136           21#
$SWRNK= 000000           14   1848
$TKB    001144           21#  1841
$TKS    001142           21#  1603   1841
$TN   = 000033            6#    11    154#   222    263#   272#   290#   311#   332#   424    428#   491    512#
                        553#   583#   594#   680#   689    691    724#   746#   776#   787#   805#   829#   854#
                        876#   896#   917#   931#   995#  1062#  1211#
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$TPS    001146           21#  1854
$TRAP   024110          112   1858#
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$TYPON  023572         1856#  1858
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$XTSTR  022734         1848#
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                        1859
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COMMEN  12#
ENDCOM  12#
ERROR   12#    92   188   218   703   719  1263  1324  1608  1645
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MULT    12#
NEWTST  12#   154   263   272   290   311   332   428   512   553   583   594   680   724   746
       776    787   805   829   854   876   896   917   931   995  1062  1211
POP     12#  1616  1842  1857  1859
PUSH    12#  1616  1842  1857  1859
SCOPE   12#   154   263   272   290   311   332   428   512   553   583   594   680   724   746
       776    787   805   829   854   876   896   917   931   983   995  1062  1211
SETTRA  1858#
SETUP   12#   112
SKIP    12#   161   164   167   216   222   356   424   491   602   613   620   689   691   748
      1000   1154  1308  1540
SLASH   12#
SPACE   12#
STARS   12#    21   154   263   272   290   311   332   428   512   553   583   594   680   724
       746    776   787   805   829   854   876   896   917   931   983   995  1062  1211  1616
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TRNTRP  1858#
TYPBIN  12#
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TYPNUM  12#
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       776    787   805   829   854   876   896   917   931   995  1062  1211
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.SETUP   8#    23
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MAINDEC-11-DZVTC-C MACY11 27(732) 24-AUG-76 14:41 PAGE 3-1 SEQ 0086
DZVTCC.P13 CROSS REFERENCE TABLE -- MACRO NAMES

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.STYPO      7#   1856
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        1854  1856  1857
ASL      204   205  1369  1842  1852  1857  1858
ASLB    1616
ASR      209   211   534   563  1430  1461  1462  1463  1485  1486
BCC     1565  1576  1616
BCS     1572
BEQ      173   184   195   214   385   398   501   646   753   883   983  1010  1064  1073  1088
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        1848  1850  1852  1854  1856
BGE     1854
BGT      983  1616  1842  1856
BHI      127   641   656  1019  1363  1590
BIC      169   170   171   637   652   983  1005  1288  1361  1366  1511  1518  1525  1545  1553
        1588  1600  1841  1842  1856
BIS     1550  1552  1573  1577  1594  1616  1856
BISB     666  1852
BIT      213   394   397   601   725   747   750   752   897  1063  1072  1087  1111  1127  1142
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BITB    1854
BLO     1365
BLOS     639   654  1841
BLT     1616  1842  1854  1856
BMI      530   572   662   691  1260  1265  1279  1616
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        1859
BPL      121   203   368   389   393   413   424   439   441   507   533   567   770   945   985
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        1850  1854  1856
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        1848  1852  1854  1856  1859
CLR       95    96    99   102   112   113   114   129   136   182   189   681   682   707   708
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CLRB    1616  1841  1842  1848  1854
CMP       91   112   126   306   328   629   638   640   653   655   820   845   911   983  1248
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CMPB     175   177   183   612  1009  1018  1266  1362  1364  1447  1554  1589  1841  1842  1848
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DECB     986  1854  1856
EMT       12
HALT      15  1850  1854  1859
INC      101   305   327   819   844   910   983  1007  1026  1247  1268  1291  1295  1446  1566
        1616  1850  1856  1857  1859
INCB    1848  1850  1854
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	779	782	784	788	791	794	797	801	803	806	811	812	817	822	825
	827	830	835	837	842	847	850	852	855	858	859	860	863	864	868
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	1116	1118	1119	1124	1129	1132	1134	1135	1139	1144	1147	1149	1155	1158	1160
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	1194	1196	1198	1200	1202	1203	1208	1213	1216	1354	1357	1359	1502	1504	1536
	1539	1584	1596	1606	1621	1624	1850	1854							
MOV	94	97	98	103	105	107	109	110	112	115	125	133	135	137	139
	140	141	143	145	147	162	165	168	193	194	199	200	201	208	210
	212	275	293	295	296	304	314	316	317	326	338	339	340	358	365
	376	377	383	396	409	432	434	435	477	480	482	495	496	497	500
	522	525	531	562	564	568	586	622	623	624	625	626	627	628	633
	636	642	643	644	651	657	660	695	696	709	728	735	756	763	764
	766	771	781	790	800	808	809	810	815	816	824	832	833	834	840
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	946	983	987	988	996	1008	1065	1067	1068	1071	1081	1086	1096	1101	1110
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	1841	1842	1848	1850	1852	1854	1856	1857	1858	1859					
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	608	609	616	617	663	664	665	1002	1003	1004	1015	1016	1021	1022	1024
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	1842	1850	1854	1856	1858										
NEG	1616	1856													
NOP	220	535	536	537	894	983	1325	1326	1327	1328	1372	1373	1464	1465	1466
	1467	1468	1475	1476	1477	1491	1492	1493							
RESET	111	983													
ROL	1522	1523	1842	1856	1857										
ROR	1515	1516	1517	1564	1571	1575									
RTI	1616	1841	1842	1848	1850	1854	1856	1859							
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	1627	1639	1646	1657	1852	1854	1857	1858							
SUB	645	658	1413	1616	1850										
SWAB	1524														
TRAP	1858														
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                1857    1858    1859
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                1857    1858    1859
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                 746     748     776     787     805     829     854     876     896     917     931     983     995    1000    1062
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.IFTF           1841    1842    1848    1850
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                 776     787     805     829     854     876     896     917     931     983     995    1062    1211    1616    1842
                1850    1857    1859
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                 428     512     553     583     594     680     724     746     776     787     805     829     854     876     896
                 917     931     983     992     995    1062    1211    1222    1841    1848    1850    1858
.PAGE             21
.REPT             15      21
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                 995    1062    1211    1223    1616    1659    1773    1841    1842    1848    1850    1852    1854    1856
                1857    1858    1859
.TITLE             11
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DEFAULT GLOBALS GENERATED:  0

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RUN-TIME:  42 28 5 SECONDS
RUN-TIME RATIO:  313/77=4.0
CORE USED:  22K  (43 PAGES)
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