VSV01

VIDEO GRAPHIC TEST

MD-11-DZVSE-A

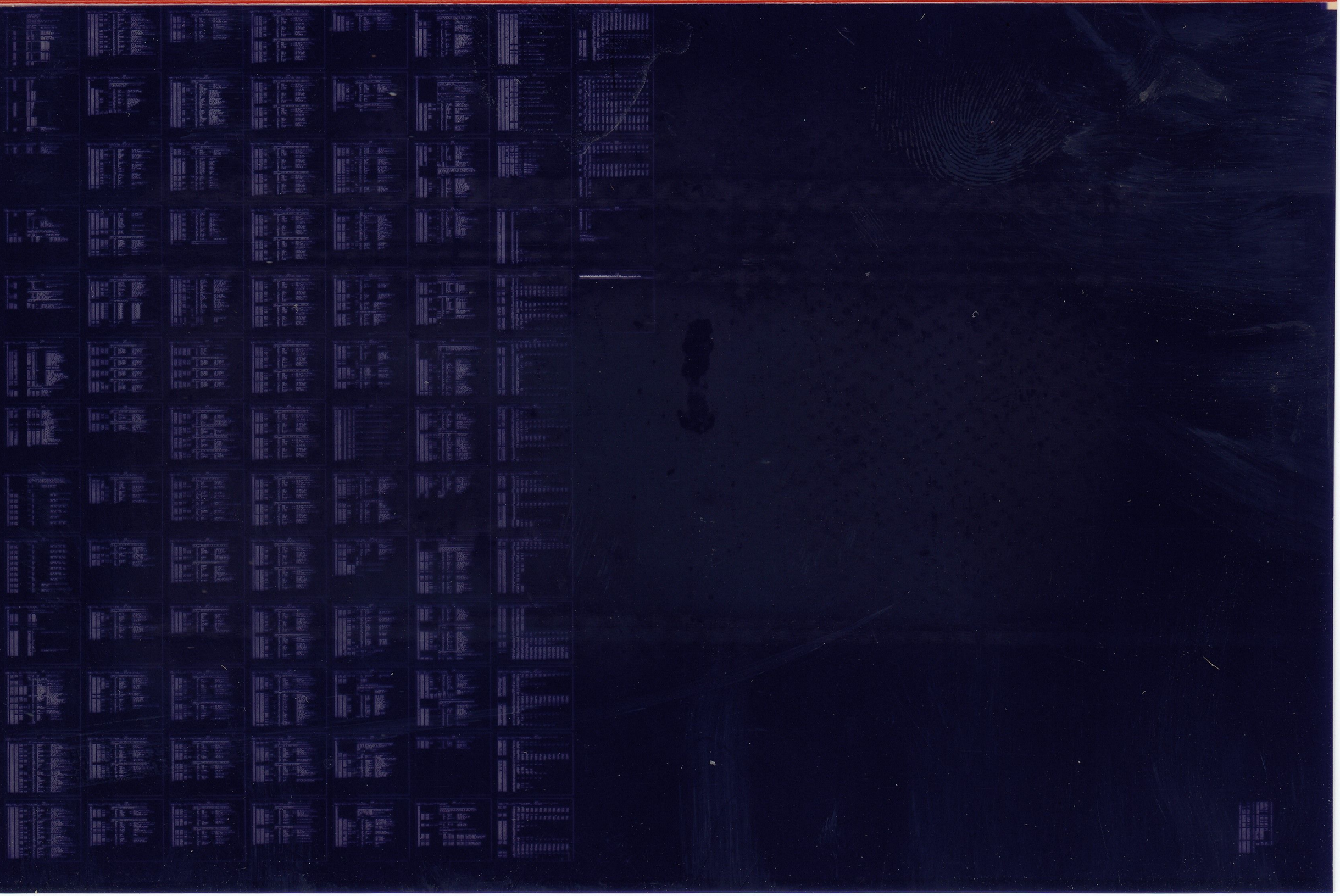
EP-DZVSE-A-DL-A

FICHE 1 OF 1

NOV 1976

digital

MADE IN USA



```
                        .TITLE  MAINDEC-11-DZVSE-A      VSV01 VIEDO GRAPHIC TEST PROGRAM
                        ;*COPYRIGHT (C) 1976
                        ;*DIGITAL EQUIPMENT CORP.
                        ;*MAYNARD, MASS. 01754
                        ;*
                        ;*PROGRAM BY RAYMOND SHOOP
                        ;*
                        ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
                        ;*PACKAGE (MAINDEC-11-DZQAC-C2), SEPT 14, 1976.
                        ;*
                        .SBTTL  BASIC DEFINITIONS

                        ;*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
000000 001100           STACK=  1100
                        .EQUIV  EMT,ERROR       ;;BASIC DEFINITION OF ERROR CALL
                        .EQUIV  IOT,SCOPE       ;;BASIC DEFINITION OF SCOPE CALL

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

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

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

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

```
                        ;
                        ;SW11=   4000
                        ;SW10=   2000
                        ;SW09=   1000
                        ;SW08=   400
                        ;SW07=   200
                        ;SW06=   100
                        ;SW05=   40
                        ;SW04=   20
                        ;SW03=   10
                        ;SW02=   4
                        ;SW01=   2
                        ;SW00=   1
                        .EQUIV  SW09,SW9
                        .EQUIV  SW08,SW8
                        .EQUIV  SW07,SW7
                        .EQUIV  SW06,SW6
                        .EQUIV  SW05,SW5
                        .EQUIV  SW04,SW4
                        .EQUIV  SW03,SW3
                        .EQUIV  SW02,SW2
                        .EQUIV  SW01,SW1
                        .EQUIV  SW00,SW0

                        ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
                        ;BIT15=  100000
                        ;BIT14=  40000
                        ;BIT13=  20000
                        ;BIT12=  10000
                        ;BIT11=  4000
                        ;BIT10=  2000
                        ;BIT09=  1000
                        ;BIT08=  400
                        ;BIT07=  200
                        ;BIT06=  100
                        ;BIT05=  40
                        ;BIT04=  20
                        ;BIT03=  10
                        ;BIT02=  4
                        ;BIT01=  2
                        ;BIT00=  1
                        .EQUIV  BIT09,BIT9
                        .EQUIV  BIT08,BIT8
                        .EQUIV  BIT07,BIT7
                        .EQUIV  BIT06,BIT6
                        .EQUIV  BIT05,BIT5
                        .EQUIV  BIT04,BIT4
                        .EQUIV  BIT03,BIT3
                        .EQUIV  BIT02,BIT2
                        .EQUIV  BIT01,BIT1
                        .EQUIV  BIT00,BIT0

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

```
                        ;
                        ;BPTVEC= 14             ;;BREAKPOINT TRAP (BPT)
                        ;IOTVEC= 20             ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
                        ;PWRVEC= 24             ;;POWER FAIL
                        ;EMTVEC= 30             ;;EMULATOR TRAP (EMT) **ERROR**
                        ;TRAPVEC=34             ;;"TRAP" TRAP
                        ;TKVEC=  60             ;;TTY KEYBOARD VECTOR
                        ;TPVEC=  64             ;;TTY PRINTER VECTOR
                        ;PIRQVEC=240            ;;PROGRAM INTERRUPT REQUEST VECTOR
```

```
                        172600          ABASE=172600
                        100360          AVECT1=100360
                        000200          APRIOR=200
                        000003          ADEVM=3

                                        .SBTTL  OPERATIONAL SWITCH SETTINGS
                                        ;*
                                        ;*      SWITCH                  USE
                                        ;*      ------          --------------------
                                        ;*        15            HALT ON ERROR
                                        ;*        14            LOOP ON TEST
                                        ;*        13            INHIBIT ERROR TYPEOUTS
                                        ;*        12            INHIBIT SUB-TEST DELAY
                                        ;*        10            INHIBIT VISUAL SYNC/CHARACTER TEST PATTERNS
                                        ;*         8            LOOP ON TEST IN SWR<7:0>
                                        ;*         9            INHIBIT VISUAL BIT MAP TEST PATTERNS
                                        .SBTTL  TRAP CATCHER

                        000000                  .=0
                                        ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
                                        ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
                                        ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
                        000174                  .=174
  000174  000000                       DISPREG: .WORD  0               ;;SOFTWARE DISPLAY REGISTER
  000176  000000                       SWREG:   .WORD  0               ;;SOFTWARE SWITCH REGISTER
                                        .SBTTL  STARTING ADDRESS(ES)
  000200  000137  001572                        JMP     @#BEGIN ;;JUMP TO STARTING ADDRESS OF PROGRAM
  000204  000137  015442                        JMP     @#HATCH                 ;DISPLAY CROSS HATCH PATTERN
  000210  000137  015642                        JMP     @#CROSS                 ;DISPLAY CROSS HAIRS FOR OPERATOR
  000214  000137  016322                        JMP     FRANKD                  ;DISPLAY CROSS HAIRS WITH TWO MAPS
  000220  000137  001564                        JMP     BURNIN                  ;JUMP TO  SET "BURN-IN" MODE FLAG
  000224  000137  016416                        JMP     BUSOUT                  ;JUMP TO BUS TIME-OUT LOOP
```

```
                                .SBTTL  ACT11 HOOKS

                                ;;******************************************************************
                                ;HOOKS REQUIRED BY ACT11
                 000230                 $SVPC=.                 ;SAVE PC
                 000046                 .=46
 000046  003304                 $ENDAD                  ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
                 000052                 .=52
 000052  000000                 .WORD   0               ;;2)SET LOC.52 TO ZERO
                 000230                 .=$SVPC                 ;; RESTORE PC
                 001000                 .=1000
                                .SBTTL  APT PARAMETER BLOCK

                                ;;******************************************************************
                                ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
                                ;;******************************************************************
                 001000                 .$X=.   ;;SAVE CURRENT LOCATION
                 000024         .=24    ;;SET POWER FAIL TO POINT TO START OF PROGRAM
 000024  000200         200     ;;FOR APT START UP
                 000044         .=44    ;;POINT TO APT INDIRECT ADDRESS PNTR.
 000044  001000         $APTHDR ;;POINT TO APT HEADER BLOCK
                 001000         .=.$X   ;;RESET LOCATION COUNTER
                                ;;******************************************************************
                                ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
                                ;INTERFACE SPEC.

 001000                         $APTHD:
 001000  000000 $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
 001002  001172 $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
 001004  000000 $TSTM:  .WORD           ;;RUN TIM OF LONGEST TEST
 001006  000000 $PASTM: .WORD           ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
 001010  000000 $UNITM: .WORD           ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
 001012  000032         .WORD   $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
```

```
                                .SBTTL  COMMON TAGS

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

                        001100                  .=1100
001100                  $CMTAG:                         ;;START OF COMMON TAGS
001100  000000                  .WORD   0
001102  000             $TSTNM: .BYTE   0               ;;CONTAINS THE TEST NUMBER
001103  000             $ERFLG: .BYTE   0               ;;CONTAINS ERROR FLAG
001104  000000          $ICNT:  .WORD   0               ;;CONTAINS SUBTEST ITERATION COUNT
001106  000000          $LPADR: .WORD   0               ;;CONTAINS SCOPE LOOP ADDRESS
001110  000000          $LPERR: .WORD   0               ;;CONTAINS SCOPE RETURN FOR ERRORS
001112  000000          $ERTTL: .WORD   0               ;;CONTAINS TOTAL ERRORS DETECTED
001114  000             $ITEMB: .BYTE   0               ;;CONTAINS ITEM CONTROL BYTE
001115  001             $ERMAX: .BYTE   1               ;;CONTAINS MAX. ERRORS PER TEST
001116  000000          $ERRPC: .WORD   0               ;;CONTAINS PC OF LAST ERROR INSTRUCTION
001120  000000          $GDADR: .WORD   0               ;;CONTAINS ADDRESS OF 'GOOD' DATA
001122  000000          $BDADR: .WORD   0               ;;CONTAINS ADDRESS OF 'BAD' DATA
001124  000000          $GDDAT: .WORD   0               ;;CONTAINS 'GOOD' DATA
001126  000000          $BDDAT: .WORD   0               ;;CONTAINS 'BAD' DATA
001130  000000                  .WORD   0               ;;RESERVED--NOT TO BE USED
001132  000000                  .WORD   0
001134  000             $AUTOB: .BYTE   0               ;;AUTOMATIC MODE INDICATOR
001135  000             $INTAG: .BYTE   0               ;;INTERRUPT MODE INDICATOR
001136  000000                  .WORD   0
001140  177570          SWR:    .WORD   DSWR            ;;ADDRESS OF SWITCH REGISTER
001142  177570          DISPLAY: .WORD  DDISP           ;;ADDRESS OF DISPLAY REGISTER
001144  177560          $TKS:   177560                  ;;TTY KBD STATUS
001146  177562          $TKB:   177562                  ;;TTY KBD BUFFER
001150  177564          $TPS:   177564                  ;;TTY PRINTER STATUS REG. ADDRESS
001152  177566          $TPB:   177566                  ;;TTY PRINTER BUFFER REG. ADDRESS
001154  000             $NULL:  .BYTE   0               ;;CONTAINS NULL CHARACTER FOR FILLS
001155  002             $FILLS: .BYTE   2               ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
001156  012             $FILLC: .BYTE   12              ;;INSERT FILL CHARS. AFTER A "LINE FEED"
001157  000             $TPFLG: .BYTE   0               ;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
001160  000000          $REGAD: .WORD   0               ;;CONTAINS THE ADDRESS FROM
                                                        ;;WHICH  ($REG0) WAS OBTAINED
001162  000000          $REG0:  .WORD   0               ;;CONTAINS (($REGAD)+0)
001164  000000          $REG1:  .WORD   0               ;;CONTAINS (($REGAD)+2)
001166  077             $QUES:  .ASCII  /?/             ;;QUESTION MARK
001167  015             $CRLF:  .ASCII  <15>            ;;CARRIAGE RETURN
001170  000012          $LF:    .ASCIZ  <12>            ;;LINE FEED
                                ;;**********************************************************************
                                .SBTTL  APT MAILBOX-ETABLE

                                ;;**********************************************************************
                                .EVEN
001172                  $MAIL:                          ;;APT MAILBOX
001172  000000          $MSGTY: .WORD   AMSGTY          ;;MESSAGE TYPE CODE
001174  000000          $FATAL: .WORD   AFATAL          ;;FATAL ERROR NUMBER
001176  000000          $TESTN: .WORD   ATESTN          ;;TEST NUMBER
001200  000000          $PASS:  .WORD   APASS           ;;PASS COUNT
001202  000000          $DEVCT: .WORD   ADEVCT          ;;DEVICE COUNT
001204  000000          $UNIT:  .WORD   AUNIT           ;;I/O UNIT NUMBER
```

```
001206  000000                  $MSGAD: .WORD   AMSGAD  ;;MESSAGE ADDRESS
001210  000000                  $MSGLG: .WORD   AMSGLG  ;;MESSAGE LENGTH
001212                          $ETABLE:                ;;APT ENVIRONMENT TABLE
001212      000                 $ENV:   .BYTE   AENV    ;;ENVIRONMENT BYTE
001213      000                 $ENVM:  .BYTE   AENVM   ;;ENVIRONMENT MODE BITS
001214  000000                  $SWREG: .WORD   ASWREG  ;;APT SWITCH REGISTER
001216  000000                  $USWR:  .WORD   AUSWR   ;;USER SWITCHES
001220  000000                  $CPUOP: .WORD   ACPUOP  ;;CPU TYPE,OPTIONS
                                :*                      BITS 15-11=CPU TYPE
                                :*                              11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
                                :*                              11/70=06,PDQ=07,Q=10
                                :*                      BIT 10=REAL TIME CLOCK
                                :*                      BIT  9=FLOATING POINT PROCESSOR
                                :*                      BIT  8=MEMORY MANAGEMENT
001222      000                 $MAMS1: .BYTE   AMAMS1  ;;HIGH ADDRESS,M.S. BYTE
001223      000                 $MTYP1: .BYTE   AMTYP1  ;;MEM. TYPE,BLK#1
                                :*                      MEM.TYPE BYTE   --  (HIGH BYTE)
                                :*                              900 NSEC CORE=001
                                :*                              300 NSEC BIPOLAR=002
                                :*                              500 NSEC MOS=003
001224  000000                  $MADR1: .WORD   AMADR1  ;;HIGH ADDRESS,BLK#1
                                :*                        MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF "TYPE" ABOVE
001226      000                 $MAMS2: .BYTE   AMAMS2  ;;HIGH ADDRESS,M.S. BYTE
001227      000                 $MTYP2: .BYTE   AMTYP2  ;;MEM.TYPE,BLK#2
001230  000000                  $MADR2: .WORD   AMADR2  ;;MEM.LAST ADDRESS,BLK#2
001232      000                 $MAMS3: .BYTE   AMAMS3  ;;HIGH ADDRESS,M.S.BYTE
001233      000                 $MTYP3: .BYTE   AMTYP3  ;;MEM.TYPE,BLK#3
001234  000000                  $MADR3: .WORD   AMADR3  ;;MEM.LAST ADDRESS,BLK#3
001236      000                 $MAMS4: .BYTE   AMAMS4  ;;HIGH ADDRESS,M.S.BYTE
001237      000                 $MTYP4: .BYTE   AMTYP4  ;;MEM.TYPE,BLK#4
001240  000000                  $MADR4: .WORD   AMADR4  ;;MEM.LAST ADDRESS,BLK#4
001242  100360                  $VECT1: .WORD   AVECT1  ;;INTERRUPT VECTOR#1,BUS PRIORITY#1
001244  000000                  $VECT2: .WORD   AVECT2  ;;INTERRUPT VECTOR#2BUS PRIORITY#2
001246  172600                  $BASE:  .WORD   ABASE   ;;BASE ADDRESS OF EQUIPMENT UNDER TEST
001250  000003                  $DEVM:  .WORD   ADEVM   ;;DEVICE MAP
001252  000000                  $CDW1:  .WORD   ACDW1   ;;CONTROLLER DESCRIPTION WORD#1
001254  000000                  $CDW2:  .WORD   ACDW2   ;;CONTROLLER DESCRIPTION WORD#2
001256                          $ETEND:
                                .MEXIT
```

```
                        .SBTTL  ERROR POINTER TABLE

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

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

001256                  $ERRTB:

                        ;ITEM   1

001256  023032                  EM1                             ;BUS ERROR TRAP ON CHARACTER ADDRESSES
001260  024004                  DH1                             ;ERRPC  ADR
001262  024226                  DT1                             ;$ERRPC $BDDAT
001264  024322                  DF0

                        ;ITEM   2
001266  023133                  EM2                             ;BUS ERROR TRAP ON BIT MAP ADDRESSES
001270  024004                  DH1                             ;ERRPC  ADR
001272  024226                  DT1                             ;$ERRPC $BDDAT
001274  024322                  DF0

                        ;ITEM   3
001276  023214                  EM3                             ;CHARACTER STATUS REGISTER ERROR
001300  024060                  DH3                             ;ERRPC  ADR     GOOD    BAD
001302  024234                  DT3                             ;$ERRPC VCCSR   $GDDAT  $BDDAT
001304  024322                  DF0

                        ;ITEM   4
001306  023254                  EM4                             ;VERTICAL SYNC ERROR
001310  024105                  DH4                             ;ERRPC  ADR     TIME0   TIME1
001312  024246                  DT4                             ;$ERRPC VCCSR   SAVE0   SAVE2
001314  024322                  DF0

                        ;ITEM   5
001316  023300                  EM5                             ;VERTICAL SYNC ERROR/
001320  024135                  DH5                             ;ERRPC  VCCSR
001322  024260                  DT5                             ;$ERRPC VCCSR
001324  024322                  DF0

                        ;ITEM   6
001326  023336                  EM6                             ;BIT MAP STATUS REGISTER ERROR
001330  024151                  DH6                             ;ERRPC  ADR     GOOD    BAD
001332  024266                  DT6                             ;$ERRPC VGCSR   $GDDAT  $BDDAT
001334  024322                  DF0
```

```
                                ;ITEM   7
001336  023374                          EM7                     ;BIT MAP P.C. REGISTER ERROR
001340  024151                          DH6                     ;ERRPC  VGCSR   GOOD    BAD
001342  024266                          DT6                     ;$ERRPC VGCSR   $GDDAT  $BDDAT
001344  024322                          DFO

                                ;ITEM   10
001346  023430                          EM10                    ;BIT MAP P.C INCREMENT ERROR
001350  024151                          DH6                     ;ERRPC  VGCSR   GOOD    BAD
001352  024266                          DT6                     ;$ERRPC VGCSR   $GDDAT  $BDDAT
001354  024322                          DFO

                                ;ITEM   11
001356  023465                          EM11                    ;WORD ERROR ON PIXEL BIT 0
001360  024151                          DH6                     ;ERRPC  VGCSR   GOOD    BAD
001362  024266                          DT6                     ;$ERRPC VGCSR   $GDDAT  $BDDAT
001364  024322                          DFO

                                ;ITEM   12
001366  023524                          EM12                    ;BYTE ERROR ON PIXEL BIT 0
001370  024151                          DH6                     ;ERRPC  VGCSR   GOOD    BAD
001372  024266                          DT6                     ;$ERRPC VGCSR   $GDDAT  $BDDAT
001374  024322                          DFO

                                ;ITEM   13
001376  023563                          EM13                    ;CHARACTER READY ERROR
001400  024151                          DH6                     ;ERRPC  VCCSR   GOOD    BAD
001402  024266                          DT6                     ;$ERRPC VCCSR   $GDDAT  $BDDAT
001404  024322                          DFO

                                ;ITEM   14
001406  023611                          EM14                    ;BIT MAP READY ERROR
001410  024151                          DH6                     ;ERRPC  VGCSR   GOOD    BAD
001412  024266                          DT6                     ;$ERRPC VGCSR   $GDDAT  $BDDAT
001414  024322                          DFO

                                ;ITEM   15
001416  023611                          EM14                    ;BIT MAP READY FAILED TO SET
001420  024176                          DH15                    ;ERRPC  VGCSR
001422  024300                          DT15                    ;$ERRPC $VGCSR
001424  024322                          DFO

                                ;ITEM   16
001426  023635                          EM16            ;PREVIOUSLY EXISTING BIT MAP DOES NOT EXIST NOW
001430  024212                          DH16            ;ERRPC  VSV01
001432  024306                          DT16            ;$ERRPC $BDDAT
001434  024322                          DFO

                                ;ITEM   17
001436  023714                          EM17            ;PREVIOUSLY EXISTING VTV01 CONTROLLER DOES NOT EXIST NOW
001440  024212                          DH16            ;ERRPC  VSV01
001442  024306                          DT16            ;$ERRPC $GDADR
001444  024322                          DFO
```

```
                                ;VTVO1 BUS ADDRESSES AND VECTOR

                                        .SBTTL  VSVO1 BUS ADDRESSES AND VECTORS

001446  172600                  VCCSR:  ABASE
001450  172602                  VCHRLO: ABASE+2
001452  172603                  VCHRHI: ABASE+3
001454  172604                  VCPOS:  ABASE+4
001456  172605                  VCPOSH: ABASE+5
001460  172620                  VGCSR:  ABASE+20
001462  172622                  VGPC:   ABASE+22
001464  172624                  VGBUF:  ABASE+24
001466  172630                  VGCOLR: ABASE+30

001470  100360                  VCINT:  AVECT1
001472  100362                  VCINT1: AVECT1+2

                                ;MISC. LOCATIONS

                                        .SBTTL  MISC. LOCATIONS

001474  000000                  $TEMP:  0
001476  000000                  $TEMP0: 0
001500  000105                  KE:     105             ;ASCII CHARACTER USED IN FULL SCREEN PATTERN
001502  000000                  TEMP1:  0
001504  000000                  TEMP2:  0
001506  000000                  TEMP3:  0
001510  000000                  SAVE0:  0
001512  000000                  SAVE1:  0
001514  000000                  SAVE2:  0
001516  000000                  SAVE3:  0
001520  003100                  TOTALC: 1600.
001522  000100                  WIDTH:  64.
001524  000030                  VH0:    24.
001526  000014                  VH1:    12.
001530  000000                  STCHAR: 0
001532  000137                  LASTCH: 137
001534  000000                  TEMP0:  0
001536  000400                  XHAIR:  256.
001540  000400                  YHAIR:  256.
001542  010000                  NUMPIX: 4096.
001544  000000                  BURN:   0
001546  000001                  COAXSW: 1               ;BIT 0-4 SELECT RELAY CONTACTS IN "BURN-IN" MODE
001550  167772                  COAX:   167772          ;BUS ADDRESS OF COAX SWITCH
001552  000000                  MSAVE0: 0
001554  000000                  MSAVE1: 0
001556  000000                  MSAVE2: 0
001560  000000                  MSAVE3: 0
001562  000000                  MSAVE4: 0
```

```
                                ;
                                ;
001564  005237  001544  BURNIN: INC     BURN            ;SET BURN-IN MODE FLAG
001570  000402                  BR      CONT
001572  005037  001544  BEGIN:  CLR     BURN            ;CLEAR "BURN-IN " MODE FLAG
001576                  CONT:
                        .SBTTL  INITIALIZE THE COMMON TAGS
                        ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
001576  012706  001100          MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
001602  005026                  CLR     (R6)+           ;;CLEAR MEMORY LOCATION
001604  022706  001140          CMP     #SWR,R6 ;;DONE?
001610  001374                  BNE     .-6             ;;LOOP BACK IF NO
001612  012706  001100          MOV     #STACK,SP       ;;SETUP THE STACK POINTER
                        ;;INITIALIZE A FEW VECTORS
001616  012737  017706  000020  MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
001624  012737  000340  000022  MOV     #340,@#IOTVEC+2 ;;LEVEL 7
001632  012737  020036  000030  MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
001640  012737  000340  000032  MOV     #340,@#EMTVEC+2 ;;LEVEL 7
001646  012737  022630  000034  MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
001654  012737  000340  000036  MOV     #340,@#TRAPVEC+2;LEVEL 7
001662  012737  021002  000024  MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
001670  012737  000340  000026  MOV     #340,@#PWRVEC+2 ;;LEVEL 7
001676  013737  003252  003244  MOV     $ENDCT,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
001704  012737  001704  001106  MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
                        ;;SIZE FOR A HARDWARE SWITCH REGISTER. IF NOT FOUND OR IT IS
                        ;;EQUAL TO A "-1", SETUP FOR A SOFTWARE SWITCH REGISTER.
001712  013746  000004          MOV     @#ERRVEC,-(SP)  ;;SAVE ERROR VECTOR
001716  012737  001752  000004  MOV     #64$,@#ERRVEC   ;;SET UP ERROR VECTOR
001724  012737  177570  001140  MOV     #DSWR,SWR       ;;SETUP FOR A HARDWARE SWICH REGISTER
001732  012737  177570  001142  MOV     #DDISP,DISPLAY  ;;AND A HARDWARE DISPLAY REGISTER
001740  022777  177777  177172  CMP     #-1,@SWR        ;;TRY TO REFERENCE HARDWARE SWR
001746  001012                  BNE     66$             ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
                                                        ;;AND  THE HARDWARE SWR IS NOT = -1
001750  000403                  BR      65$             ;;BRANCH IF NO TIMEOUT
001752  012716  001760  64$:    MOV     #65$,(SP)       ;;SET UP FOR TRAP RETURN
001756  000002                  RTI
001760  012737  000176  001140  65$:    MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
001766  012737  000174  001142          MOV     #DISPREG,DISPLAY
001774  012637  000004  66$:    MOV     (SP)+,@#ERRVEC  ;;RESTORE ERROR VECTOR
                                ;
002000  005037  001200          CLR     $PASS           ;;CLEAR PASS COUNT
002004  132737  000200  001213  BITB    #APTSIZE,$ENVM  ;;TEST USER SIZE UNDER APT
002012  001403                  BEQ     67$             ;;YES,USE NON-APT SWITCH
002014  012737  001214  001140  MOV     #$SWREG,SWR     ;;NO,USE APT SWITCH REGISTER
002022                  67$:
002022  005037  001552          CLR     MSAVE0                  ;RESET MAP COUNTERS
002026  005037  001554          CLR     MSAVE1
002032  005037  001556          CLR     MSAVE2                  ; AND CONTROLLER
002036  005037  001560          CLR     MSAVE3
002042  005037  001562          CLR     MSAVE4                  ; LOCATIONS
002046  005737  000042          TST     @#42                    ;TEST IF IN CHAIN MODE
002052  001002                  BNE     RESTAT
002054  104401                  TYPE
002056  022712                  TITLE
002060  000005  RESTAT: RESET
```

```
                                        .SBTTL
                                        .SBTTL  DETERMINE THE NUMBER OF CONTROLLERS TO TEST

002062  013737  001246  001120  DETERO: MOV     $BASE,$GDADR            ;LOAD BASE ADDR.
002070  012737  002242  007366          MOV     #4$,RETURN              ;LOAD RETURN ADDR. AFTER TESTING
002076  004737  003340                  JSR     PC,DETECT               ;DETERMINE # OF MAPS
002102  000453                          BR      3$                      ;BR IF CONTROLLER DOESN'T EXIST
002104  004737  003576                  JSR     PC,LODADR               ;FIX THE BUS ADDRESSES
002110  005737  001254                  TST     $CDW2                   ;TEST IF THE OPERATOR HAS SELECTED SOME MAPS
002114  001407                          BEQ     6$                      ;BR IF NOT
002116  013737  001254  001252          MOV     $CDW2,$CDW1             ;LOAD HIS SELECTION
002124  052737  100000  001552          BIS     #BIT15,MSAVE0   ;SET CONTROLLER EXISTS FLAG
002132  000430                          BR      2$                      ;AND TEST THEM
002134  105737  001213          6$:     TSTB    $ENVM                   ;TEST IF "DO NOT SIZE" IS SET
002140  100007                          BPL     5$                      ;BR IF NOT
002142  013737  001250  001252          MOV     $DEVM,$CDW1             ;USE VALUE SUPPLIED BY "APT"
002150  052737  100000  001552          BIS     #BIT15,MSAVE0   ;SET CONTROLLER EXISTS FLAG
002156  000416                          BR      2$
002160  005737  001200          5$:     TST     $PASS                   ;TEST IF FIRST PASS
002164  001006                          BNE     1$                      ;BR IF NOT
002166  013737  001512  001552          MOV     SAVE1,MSAVE0            ;SAVE THE NUMBER OF MAPS
002174  052737  100000  001552          BIS     #BIT15,MSAVE0           ;SET "CONTROLLER EXISTS" FLAG
002202  123737  001512  001552  1$:     CMPB    SAVE1,MSAVE0            ;COMPARE IF ANY CHANGE IN # OF MAPS
002210  001401                          BEQ     2$                      ;BR IF NOT
002212  104016                          ERROR   16              ;PREVIOUSLY EXISTING BIT MAP DOES NOT EXIST NOW
002214  012737  000001  001546  2$:     MOV     #1,COAXSW               ;LOAD SWITCH VALUE
002222  005037  001102                  CLR     $TSTNM                  ;RESET TEST #
002226  000137  003762                  JMP     TST1                    ;AND TEST THIS CONTROLLER
002232  005737  001552          3$:     TST     MSAVE0                  ;TEST IF CONTROLLER EXISTED AT ONE TIME
002236  100001                          BPL     4$                      ;BR IF NO
002240  104017                          ERROR   17      ;PREVIOUSLY EXISTING  CONTROLLER AT 172600 DOES NOT EXIST NOW
002242  000240          4$:     NOP
002244  005737  001552                  TST     MSAVE0                  ;TEST IF THE FIRST CONTROLLER EXISTS
002250  100413                          BMI     10$                     ;BR IF IT'S THERE
002252  012737  002274  001110          MOV     #7$,$LPERR              ;LOAD LOOP RETURN
002260  012737  002274  001106          MOV     #7$,$LPADR              ;LOAD RETURN ADDRESS
002266  013737  001246  001126          MOV     $BASE,$BDDAT            ;LOAD BASE ADDRESS FOR TYPEOUT
002274  104001          7$:     ERROR   1       ;** FATAL ERROR **      ;VTV01 AT ADDRESS ($BASE) DOESN'T EXIST
002276  000776                          BR      7$                      ;FATAL ERROR
002300  005737  001544          10$:    TST     BURN                    ;TEST IF "BURN-IN" MODE
002304  001002                          BNE     DETER1                  ;BR AND TEST FOR MORE MAPS
002306  000137  003222                  JMP     DETEC7                  ;REPORT "EOP"
002312  012737  171600  001120  DETER1: MOV     #171600,$GDADR          ;LOAD BUS ADDRESS
002320  012737  002472  007366          MOV     #4$,RETURN              ;LOAD RETURN ADDR. AFTER TESTING
002326  004737  003340                  JSR     PC,DETECT               ;DETERMINE # OF MAPS
002332  000453                          BR      3$                      ;BR IF CONTROLLER DOESN'T EXIST
002334  004737  003576                  JSR     PC,LODADR               ;FIX THE BUS ADDRESSES
002340  005737  001254                  TST     $CDW2                   ;TEST IF THE OPERATOR HAS SELECTED SOME MAPS
002344  001407                          BEQ     6$                      ;BR IF NOT
002346  013737  001254  001252          MOV     $CDW2,$CDW1             ;LOAD HIS SELECTION
002354  052737  100000  001554          BIS     #BIT15,MSAVE1   ;SET CONTROLLER EXISTS FLAG
002362  000430                          BR      2$                      ;AND TEST THEM
002364  105737  001213          6$:     TSTB    $ENVM                   ;TEST IF "DO NOT SIZE" IS SET
002370  100007                          BPL     5$                      ;BR IF NOT
002372  013737  001250  001252          MOV     $DEVM,$CDW1             ;USE VALUE SUPPLIED BY "APT"
002400  052737  100000  001554          BIS     #BIT15,MSAVE1   ;SET CONTROLLER EXISTS FLAG
```

```
548  002406  000416                          BR      2$
549  002410  005737  001200          5$:     TST     $PASS                   ;TEST IF FIRST PASS
550  002414  001006                          BNE     1$                      ;BR IF NOT
551  002416  013737  001512  001554          MOV     SAVE1,MSAVE1            ;SAVE THE NUMBER OF MAPS
552  002424  052737  100000  001554          BIS     #BIT15,MSAVE1           ;SET "CONTROLLER EXISTS" FLAG
553  002432  123737  001512  001554  1$:     CMPB    SAVE1,MSAVE1            ;COMPARE IF ANY CHANGE IN # OF MAPS
554  002440  001401                          BEQ     2$                      ;BR IF NOT
555  002442  104016                          ERROR   16              ;PREVIOUSLY EXISTING BIT MAP DOES NOT EXIST NOW
556  002444  012737  000002  001546  2$:     MOV     #2,COAXSW               ;LOAD SWITCH VALUE
557  002452  005037  001102                  CLR     $TSTNM                  ;RESET TEST #
558  002456  000137  003762                  JMP     TST1                    ;AND TEST THIS CONTROLLER
559  002462  005737  001554          3$:     TST     MSAVE1                  ;TEST IF CONTROLLER EXISTED AT ONE TIME
560  002466  100001                          BPL     4$                      ;BR IF NO
561  002470  104017                          ERROR   17      ;PREVIOUSLY EXISTING  CONTROLLER AT 171600 DOES NOT EXIST NOW
562  002472  000240                  4$:     NOP
563  002474  012737  171300  001120  DETER2: MOV     #171300,$GDADR          ;LOAD BUS ADDRESS
564  002502  012737  002654  007366          MOV     #4$,RETURN              ;LOAD RETURN ADDR. AFTER TESTING
565  002510  004737  003340                  JSR     PC,DETECT               ;DETERMINE # OF MAPS
566  002514  000453                          BR      3$                      ;BR IF CONTROLLER DOESN'T EXIST
567  002516  004737  003576                  JSR     PC,LODADR               ;FIX THE BUS ADDRESSES
568  002522  005737  001254                  TST     $CDW2                   ;TEST IF THE OPERATOR HAS SELECTED SOME MAPS
569  002526  001407                          BEQ     6$                      ;BR IF NOT
570  002530  013737  001254  001252          MOV     $CDW2,$CDW1             ;LOAD HIS SELECTION
571  002536  052737  100000  001556          BIS     #BIT15,MSAVE2   ;SET CONTROLLER EXISTS FLAG
572  002544  000430                          BR      2$                      ;AND TEST THEM
573  002546  105737  001213          6$:     TSTB    $ENVM                   ;TEST IF "DO NOT SIZE" IS SET
574  002552  100007                          BPL     5$                      ;BR IF NOT
575  002554  013737  001250  001252          MOV     $DEVM,$CDW1             ;USE VALUE SUPPLIED BY "APT"
576  002562  052737  100000  001556          BIS     #BIT15,MSAVE2   ;SET CONTROLLER EXISTS FLAG
577  002570  000416                          BR      2$
578  002572  005737  001200          5$:     TST     $PASS                   ;TEST IF FIRST PASS
579  002576  001006                          BNE     1$                      ;BR IF NOT
580  002600  013737  001512  001556          MOV     SAVE1,MSAVE2            ;SAVE THE NUMBER OF MAPS
581  002606  052737  100000  001556          BIS     #BIT15,MSAVE2           ;SET "CONTROLLER EXISTS" FLAG
582  002614  123737  001512  001556  1$:     CMPB    SAVE1,MSAVE2            ;COMPARE IF ANY CHANGE IN # OF MAPS
583  002622  001401                          BEQ     2$                      ;BR IF NOT
584  002624  104016                          ERROR   16              ;PREVIOUSLY EXISTING BIT MAP DOES NOT EXIST NOW
585  002626  012737  000004  001546  2$:     MOV     #4,COAXSW               ;LOAD SWITCH VALUE
586  002634  005037  001102                  CLR     $TSTNM                  ;RESET TEST #
587  002640  000137  003762                  JMP     TST1                    ;AND TEST THIS CONTROLLER
588  002644  005737  001556          3$:     TST     MSAVE2                  ;TEST IF CONTROLLER EXISTED AT ONE TIME
589  002650  100001                          BPL     4$                      ;BR IF NO
590  002652  104017                          ERROR   17      ;PREVIOUSLY EXISTING  CONTROLLER AT 171300 DOES NOT EXIST NOW
591  002654  000240                  4$:     NOP
592  002656  012737  172300  001120  DETER3: MOV     #172300,$GDADR          ;LOAD BUS ADDRESS
593  002664  012737  003036  007366          MOV     #4$,RETURN              ;LOAD RETURN ADDR. AFTER TESTING
594  002672  004737  003340                  JSR     PC,DETECT               ;DETERMINE # OF MAPS
595  002676  000453                          BR      3$                      ;BR IF CONTROLLER DOESN'T EXIST
596  002700  004737  003576                  JSR     PC,LODADR               ;FIX THE BUS ADDRESSES
597  002704  005737  001254                  TST     $CDW2                   ;TEST IF THE OPERATOR HAS SELECTED SOME MAPS
598  002710  001407                          BEQ     6$                      ;BR IF NOT
599  002712  013737  001254  001252          MOV     $CDW2,$CDW1             ;LOAD HIS SELECTION
600  002720  052737  100000  001560          BIS     #BIT15,MSAVE3   ;SET CONTROLLER EXISTS FLAG
601  002726  000430                          BR      2$                      ;AND TEST THEM
602  002730  105737  001213          6$:     TSTB    $ENVM                   ;TEST IF "DO NOT SIZE" IS SET
603  002734  100007                          BPL     5$                      ;BR IF NOT
```

```
 604  002736  013737  001250  001252          MOV     $DEVM,$CDW1             ;USE VALUE SUPPLIED BY "APT"
 605  002744  052737  100000  001560          BIS     #BIT15,MSAVE3   ;SET CONTROLLER EXISTS FLAG
 606  002752  000416                          BR      2$
 607  002754  005737  001200          5$:     TST     $PASS                   ;TEST IF FIRST PASS
 608  002760  001006                          BNE     1$                      ;BR IF NOT
 609  002762  013737  001512  001560          MOV     SAVE1,MSAVE3            ;SAVE THE NUMBER OF MAPS
 610  002770  052737  100000  001560          BIS     #BIT15,MSAVE3           ;SET "CONTROLLER EXISTS" FLAG
 611  002776  123737  001512  001560  1$:     CMPB    SAVE1,MSAVE3            ;COMPARE IF ANY CHANGE IN # OF MAPS
 612  003004  001401                          BEQ     2$                      ;BR IF NOT
 613  003006  104016                          ERROR   16              ;PREVIOUSLY EXISTING BIT MAP DOES NOT EXIST NOW
 614  003010  012737  000010  001546  2$:     MOV     #10,COAXSW              ;LOAD SWITCH VALUE
 615  003016  005037  001102                  CLR     $TSTNM                  ;RESET TEST #
 616  003022  000137  003762                  JMP     TST1                    ;AND TEST THIS CONTROLLER
 617  003026  005737  001560          3$:     TST     MSAVE3                  ;TEST IF CONTROLLER EXISTED AT ONE TIME
 618  003032  100001                          BPL     4$                      ;BR IF NO
 619  003034  104017                          ERROR   17      ;PREVIOUSLY EXISTING  CONTROLLER AT 172300 DOES NOT EXIST NOW
 620  003036  000240                  4$:     NOP
 621  003040  012737  173200  001120  DETER4: MOV     #173200,$GDADR          ;LOAD BUS ADDRESS
 622  003046  012737  003220  007366          MOV     #4$,RETURN              ;LOAD RETURN ADDR. AFTER TESTING
 623  003054  004737  003340                  JSR     PC,DETECT               ;DETERMINE # OF MAPS
 624  003060  000453                          BR      3$                      ;BR IF CONTROLLER DOESN'T EXIST
 625  003062  004737  003576                  JSR     PC,LODADR               ;FIX THE BUS ADDRESSES
 626  003066  005737  001254                  TST     $CDW2                   ;TEST IF THE OPERATOR HAS SELECTED SOME MAPS
 627  003072  001407                          BEQ     6$                      ;BR IF NOT
 628  003074  013737  001254  001252          MOV     $CDW2,$CDW1             ;LOAD HIS SELECTION
 629  003102  052737  100000  001562          BIS     #BIT15,MSAVE4   ;SET CONTROLLER EXISTS FLAG
 630  003110  000430                          BR      2$                      ;AND TEST THEM
 631  003112  105737  001213          6$:     TSTB    $ENVM                   ;TEST IF "DO NOT SIZE" IS SET
 632  003116  100007                          BPL     5$                      ;BR IF NOT
 633  003120  013737  001250  001252          MOV     $DEVM,$CDW1             ;USE VALUE SUPPLIED BY "APT"
 634  003126  052737  100000  001562          BIS     #BIT15,MSAVE4   ;SET CONTROLLER EXISTS FLAG
 635  003134  000416                          BR      2$
 636  003136  005737  001200          5$:     TST     $PASS                   ;TEST IF FIRST PASS
 637  003142  001006                          BNE     1$                      ;BR IF NOT
 638  003144  013737  001512  001562          MOV     SAVE1,MSAVE4            ;SAVE THE NUMBER OF MAPS
 639  003152  052737  100000  001562          BIS     #BIT15,MSAVE4           ;SET "CONTROLLER EXISTS" FLAG
 640  003160  123737  001512  001562  1$:     CMPB    SAVE1,MSAVE4            ;COMPARE IF ANY CHANGE IN # OF MAPS
 641  003166  001401                          BEQ     2$                      ;BR IF NOT
 642  003170  104016                          ERROR   16              ;PREVIOUSLY EXISTING BIT MAP DOES NOT EXIST NOW
 643  003172  012737  000020  001546  2$:     MOV     #20,COAXSW              ;LOAD SWITCH VALUE
 644  003200  005037  001102                  CLR     $TSTNM                  ;RESET TEST #
 645  003204  000137  003762                  JMP     TST1                    ;AND TEST THIS CONTROLLER
 646  003210  005737  001562          3$:     TST     MSAVE4                  ;TEST IF CONTROLLER EXISTED AT ONE TIME
 647  003214  100001                          BPL     4$                      ;BR IF NO
 648  003216  104017                          ERROR   17      ;PREVIOUSLY EXISTING  CONTROLLER AT 173200 DOES NOT EXIST NOW
 649  003220  000240                  4$:     NOP
```

```
                                DETEC7:
                                .SBTTL  END OF PASS ROUTINE
                                
                                ;;*****************************************************************
                                ;*INCREMENT THE PASS NUMBER ($PASS)
                                ;*TYPE "END PASS #XXXXX" (WHERE XXXXX IS A DECIMAL NUMBER)
                                ;*IF THERES A MONITOR GO TO IT
                                ;*IF THERE ISN'T JUMP TO RESTAT
                                
003222                          $EOP:
003222  000240                          NOP
003224  005037  001102                  CLR     $TSTNM          ;;ZERO THE TEST NUMBER
003230  005237  001200                  INC     $PASS           ;;INCREMENT THE PASS NUMBER
003234  042737  100000  001200          BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
003242  005327                          DEC     (PC)+           ;;LOOP?
003244  000001                  $EOPCT: .WORD   1
003246  003022                          BGT     $DOAGN          ;;YES
003250  012737                          MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
003252  000001                  $ENDCT: .WORD   1
003254  003244                          $EOPCT
003256  104401  003323                  TYPE    ,$ENDMG         ;;TYPE "END PASS #"
003262  013746  001200                  MOV     $PASS,-(SP)     ;;SAVE $PASS FOR TYPEOUT
003266  104405                          TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
003270  104401  003320                  TYPE    ,$ENULL         ;;TYPE A NULL CHARACTER
003274  013700  000042          $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
003300  001405                          BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
003302  000005                          RESET                   ;;CLEAR THE WORLD
003304  004710                  $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
003306  000240                          NOP                     ;;SAVE ROOM
003310  000240                          NOP                     ;;FOR
003312  000240                          NOP                     ;;ACT11
003314                          $DOAGN:
003314  000137                          JMP     @(PC)+          ;;RETURN
003316  002060                  $RTNAD: .WORD   RESTAT
003320    377     377     000   $ENULL: .BYTE   -1,-1,0         ;;NULL CHARACTER STRING
003323    015  042412  042116   $ENDMG: .ASCIZ  <15><12>/END PASS #/
003330  050040  051501  020123
003336  000043
```

```
                                        .SBTTL  DETERMINE THE NUMBER OF BIT MAP'S ON A VTV01
                                        .SBTTL
                                
003340  013737  001120  001124  DETECT: MOV     $GDADR,$GDDAT           ;GET BASE ADDRESS
003346  012737  003570  000004          MOV     #7$,ERRVEC              ;LOAD RETURN
003354  005777  175544                  TST     @$GDDAT                 ;TEST THE CHARACTER STATUS ADDRESS
003360  005037  001504                  CLR     TEMP2                   ;THE CONTROLLER EXISTS NOW TEST THE MAPS
003364  005037  001506                  CLR     TEMP3                   ;
003370  012737  003434  000004          MOV     #2$,ERRVEC              ;LOAD BUS TRAP RETURN
003376  013737  001124  001126          MOV     $GDDAT,$BDDAT           ;GET THE ADDRESS
003404  062737  000020  001126  1$:     ADD     #20,$BDDAT              ;UPDATE THE ADDRESS
003412  005777  175510                  TST     @$BDDAT                 ;TEST FOR A MAP
003416  005237  001504                  INC     TEMP2                   ;YES IT EXISTS UPDATE THE COUNT
003422  022737  000006  001504          CMP     #6,TEMP2                ;TEST FO LAST
003430  001402                          BEQ     3$
003432  000764                          BR      1$
003434  022626                  2$:     CMP     (SP)+,(SP)+             ;POP THE STACK
003436  012737  000006  000004  3$:     MOV     #ERRVEC+2,ERRVEC                ;RESET BUS TRAP
003444  005037  000006                  CLR     ERRVEC+2
003450  005737  000042                  TST     @#42                    ;TEST IF "CHAIN MODE"
003454  001020                          BNE     4$                      ;BR IF CHAIN MODE
003456  005737  001200                  TST     $PASS                   ;TEST IF FIRST PASS
003462  001015                          BNE     4$                      ;BR IF NOT
003464  104401  022750                  TYPE    ,VTHDR1                 ;REPORT # OF MAPS
003470  013746  001124                  MOV     $GDDAT,-(SP)            ;ON THE CONTROLLER ADDRESS
003474  104402                          TYPOC
003476  104401  022774                  TYPE    ,VTHDR2                 ; "HAS"
003502  013746  001504                  MOV     TEMP2,-(SP)             ;#N
003506  104403                          TYPOS
003510     001     000                  .BYTE   1,0                     ;ONE DIGIT
003512  104401  023002                  TYPE    ,VTHDR3                 ;"MAPS INSTALLED"
003516  013737  001504  001512  4$:     MOV     TEMP2,SAVE1             ;SAVE # OF MAPS
003524  001413                          BEQ     6$                      ;BR IF NONE
003526  012737  000001  001506          MOV     #1,TEMP3                ;LOAD INDICATOR
003534  005337  001504          5$:     DEC     TEMP2                   ;CONVERT FOR LATER
003540  001405                          BEQ     6$
003542  006337  001506                  ASL     TEMP3                   ;MOVE
003546  005237  001506                  INC     TEMP3
003552  000770                          BR      5$
003554  013737  001506  001252  6$:     MOV     TEMP3,$CDW1             ;LOAD THE DETECTED MAP BIT'S
003562  062716  000002                  ADD     #2,(SP)                 ;UPDATE EXIT ADDRESS
003566  000207                          RTS     PC                      ;RETURN

003570  022626          7$:     CMP     (SP)+,(SP)+
003572  000240                  NOP
003574  000207                  RTS     PC                      ;RETURN
```

```
                                LODADR: MOV     #VCCSR,R0               ;LOAD ADDRESS POINTER
                                        MOV     $GDADR,R1               ;LOAD ADDRESS VALUE
                                10$:    MOV     R1,(R0)+                ;LOAD THE ADDRESSES
                                        CMP     #VCINT,R0               ;TEST FOR END
                                        BNE     10$
003616  062737  000002  001450          ADD     #2,VCHRLO               ;ADJUST THE ADDRESSES
003624  062737  000003  001452          ADD     #3,VCHRHI
003632  062737  000004  001454          ADD     #4,VCPOS
003640  062737  000005  001456          ADD     #5,VCPOSH
003646  062737  000020  001460          ADD     #20,VGCSR
003654  062737  000022  001462          ADD     #22,VGPC
003662  062737  000024  001464          ADD     #24,VGBUF
003670  062737  000030  001466          ADD     #30,VGCOLR
003676  013737  001242  001470          MOV     $VECT1,VCINT            ;LOAD BASIC INTR. VECTOR
003704  042737  160000  001470          BIC     #160000,VCINT           ;MASK OFF BR LEVEL BITS
003712  013737  001470  001472          MOV     VCINT,VCINT1
003720  062737  000002  001472          ADD     #2,VCINT1
003726  000207                          RTS     PC                      ;EXIT

003730  062737  000020  001460  MOVADR: ADD     #20,VGCSR               ;UPDATE BUS ADDRESSES TO NEXT MAP
003736  062737  000020  001462          ADD     #20,VGPC
003744  062737  000020  001464          ADD     #20,VGBUF
003752  062737  000020  001466          ADD     #20,VGCOLR
003760  000207                          RTS     PC                      ;EXIT


                        ;;**************************************************************
                        ;*TEST 1        VERIFY ALL BUS ADDRESSES OF THE CHARACTER GEN.
                        ;;**************************************************************
003762  000004          TST1:   SCOPE
003764  012737  177777  001204          MOV     #-1,$UNIT               ;INDIACTE A SYNC/ CHARACTER GENERATOR LOGIC ERRO
003772  012737  004030  001110          MOV     #1$,$LPERR              ;LOAD ERROR RETURN
004000  013737  001120  001124          MOV     $GDADR,$GDDAT           ;LOAD BASE ADDR.
004006  062737  000006  001124          ADD     #6,$GDDAT               ;ADJUST TO LAST ADDRESS
004014  013737  001120  001126          MOV     $GDADR,$BDDAT           ;LOAD TEST ADDRESS
004022  012737  004054  000004          MOV     #2$,@#ERRVEC            ;LOAD BUS TRAP RETURN
004030  005777  175072          1$:     TST     @$BDDAT                 ;TEST IF ADDRESS EXISTS
004034  023737  001124  001126          CMP     $GDDAT,$BDDAT           ;TEST IF FINISHED ALL ADDR.
004042  001407                          BEQ     3$                      ;;BR IF ALL DONE
004044  062737  000002  001126          ADD     #2,$BDDAT               ;ADJUST ADDRESS POINTER
004052  000766                          BR      1$                      ;TRY AGAIN

004054  022626          2$:     CMP     (SP)+,(SP)+             ;CLEAN STACK
004056  104001                  ERROR   1                       ;BUS ERROR WITH CHARACTER ADDRESS
004060  000763                  BR      1$

004062  012737  000006  000004  3$:     MOV     #ERRVEC+2,@#ERRVEC      ;RESET BUS TRAP
004070  005037  000006                  CLR     @#ERRVEC+2
```

```
                                ;;*****************************************************************
                                ;*TEST 2        TEST ALL EXISTANT BUS ADDRESSES FOR THE SELECTED BIT MAPS
                                ;;*****************************************************************
004074  000004                TST2:   SCOPE
004076  012737  004150  001110        MOV     #1$,$LPERR              ;LOAD RETURN IF ERROR
004104  013737  001120  001502        MOV     $GDADR,TEMP1            ;GET BASE ADDRESS
004112  062737  000020  001502        ADD     #20,TEMP1               ;UPDATE TO THE MAP ADDRESS
004120  013737  001252  004360        MOV     $CDW1,DEVTMP            ;GET THE SELECTED MAPS
004126  042737  177700  004360        BIC     #177700,DEVTMP          ;MASK TO LOWER SIX BITS
004134  001426                      BEQ     3$                      ;BR IF NO MAPS SELECTED
004136  005037  001204              CLR     $UNIT                   ;CLEAR MAP INDICATOR
004142  012737  000001  001506        MOV     #BIT0,TEMP3             ;LOAD TESTING BIT
004150  033737  001506  004360  1$:   BIT     TEMP3,DEVTMP            ;TEST IF THIS BIT MAP IS SELECTED
004156  001402                      BEQ     2$                      ;BR IF NOT
004160  000137  004214              JMP     10$                     ;SELECTED - TEST THIS MAP
004164  062737  000020  001502  2$:   ADD     #20,TEMP1               ;UPDATE TO NEXT BUS ADDRESS
004172  005237  001204              INC     $UNIT                   ;UPDATE MAP INDICATOR
004176  006337  001506              ASL     TEMP3                   ;MOVE THE TEST BIT
004202  022737  000100  001506        CMP     #100,TEMP3              ;TEST IF ANY MORE POSSIBLE MAPS
004210  001357                      BNE     1$                      ;BR IF MORE
004212                          3$:
004212  000463                      BR      TST3            ;;BR TO NEXT TEST

                                ;THE BIT MAP ADDRESS IS IN "TEMP1" - LOAD THE ADDRESS AND
                                ;       START TESTING THAT BIT MAP

004214  012737  004352  000004  10$:    MOV     #20$,@#4                ;LOAD FOR BUS TRAP
004222  013737  001502  001126        MOV     TEMP1,$BDDAT            ;LOAD ADDRESS POINTER
004230  005777  174672              TST     @$BDDAT                 ;TEST AN ADDRESS
004234  062737  000002  001126        ADD     #2,$BDDAT               ;UPDATE ADDRESS
004242  005777  174660              TST     @$BDDAT                 ;TEST AN ADDRESS
004246  062737  000002  001126        ADD     #2,$BDDAT               ;UPDATE ADDRESS
004254  005777  174646              TST     @$BDDAT                 ;TEST AN ADDRESS
004260  062737  000002  001126        ADD     #2,$BDDAT               ;UPDATE ADDRESS
004266  005777  174634              TST     @$BDDAT                 ;TEST AN ADDRESS
004272  062737  000002  001126        ADD     #2,$BDDAT               ;UPDATE ADDRESS
004300  005777  174622              TST     @$BDDAT                 ;TEST AN ADDRESS
004304  062737  000002  001126        ADD     #2,$BDDAT               ;UPDATE ADDRESS
004312  005777  174610              TST     @$BDDAT                 ;TEST AN ADDRESS
004316  062737  000002  001126        ADD     #2,$BDDAT               ;UPDATE ADDRESS
004324  005777  174576              TST     @$BDDAT                 ;TEST AN ADDRESS
004330  062737  000002  001126        ADD     #2,$BDDAT               ;UPDATE ADDRESS
004336  005777  174564              TST     @$BDDAT                 ;TEST AN ADDRESS
004342  062737  000002  001126        ADD     #2,$BDDAT               ;UPDATE ADDRESS
004350  000705                      BR      2$                      ;RETURN

004352  022626                  20$:    CMP     (SP)+,(SP)+             ;POP STACK
004354  104002                      ERROR   2                       ;REPORT BUS ERROR TRAP ON A SELECTED BIT MAP ADD
004356  000702                      BR      2$                      ;RETURN


004360  000003                DEVTMP: ADEVM                           ;BITS SET INDICATE THE MAPS TO BE TESTED
```

```
                                ;;*****************************************************************
                                ;*TEST 3         TEST THE CHAR CURSOR DISABLE BIT
                                ;;*****************************************************************
004362  000004                  TST3:   SCOPE
004364  012737  177777  001204          MOV     #-1,$UNIT               ;INDICATE A CONTROLLER ERROR
004372  012737  002000  001124          MOV     #BIT10,$GDDAT           ;LOAD EXPECTED VALUE
004400  013777  001124  175040          MOV     $GDDAT,@VCCSR           ;LOAD THE REGISTER
004406  017737  175034  001126          MOV     @VCCSR,$BDDAT           ;READ THE REGISTER
004414  042737  140000  001126          BIC     #140000,$BDDAT          ;MASK TO BITS 15-14
004422  023737  001124  001126          CMP     $GDDAT,$BDDAT           ;COMPARE FOR SAME
004430  001401                        BEQ     TST4            ;;BR IF EXPECTED
004432  104003                        ERROR   3                       ;'CHAR CURSOR DISABLE' FAILED TO SET

                                ;;*****************************************************************
                                ;*TEST 4         TEST THE Y CROSS HAIR ENABLE BIT
                                ;;*****************************************************************
004434  000004                  TST4:   SCOPE
004436  012737  004000  001124          MOV     #BIT11,$GDDAT           ;LOAD EXPECTED VALUE
004444  013777  001124  174774          MOV     $GDDAT,@VCCSR           ;LOAD THE REGISTER
004452  017737  174770  001126          MOV     @VCCSR,$BDDAT           ;READ THE REGISTER
004460  042737  140000  001126          BIC     #140000,$BDDAT          ;MASK TO BITS 15-14
004466  023737  001124  001126          CMP     $GDDAT,$BDDAT           ;COMPARE FOR SAME
004474  001401                        BEQ     TST5            ;;BR IF EXPECTED
004476  104003                        ERROR   3                       ;'Y CROSS HAIR ENABLE' FAILED TO SET

                                ;;*****************************************************************
                                ;*TEST 5         TEST THE X CROSS HAIR ENABLE BIT
                                ;;*****************************************************************
004500  000004                  TST5:   SCOPE
004502  012737  010000  001124          MOV     #BIT12,$GDDAT           ;LOAD EXPECTED VALUE
004510  013777  001124  174730          MOV     $GDDAT,@VCCSR           ;LOAD THE REGISTER
004516  017737  174724  001126          MOV     @VCCSR,$BDDAT           ;READ THE REGISTER
004524  042737  140000  001126          BIC     #140000,$BDDAT          ;MASK TO BITS 15-14
004532  023737  001124  001126          CMP     $GDDAT,$BDDAT           ;COMPARE FOR SAME
004540  001401                        BEQ     TST6            ;;BR IF EXPECTED
004542  104003                        ERROR   3                       ;'X CROSS HAIR ENABLE' FAILED TO SET

                                ;;*****************************************************************
                                ;*TEST 6         TEST THE VERT SYNC INTR. ENABLE BIT
                                ;;*****************************************************************
004544  000004                  TST6:   SCOPE
004546  012746  000340                  MOV     #340,-(SP)              ;RAISE PRIORITY
004552  012746  004560                  MOV     #1$,-(SP)
004556  000002                          RTI
004560  012737  020000  001124  1$:      MOV     #BIT13,$GDDAT           ;LOAD EXPECTED VALUE
004566  013777  001124  174652          MOV     $GDDAT,@VCCSR           ;LOAD THE REGISTER
004574  017737  174646  001126          MOV     @VCCSR,$BDDAT           ;READ THE REGISTER
004602  042737  140000  001126          BIC     #140000,$BDDAT          ;MASK TO BITS 15-14
004610  023737  001124  001126          CMP     $GDDAT,$BDDAT           ;COMPARE FOR SAME
004616  001401                        BEQ     2$              ;;BR IF EXPECTED
004620  104003                        ERROR   3                       ;'VERT SYNC INTR. ENABLE' FAILED TO SET
004622  042777  020000  174616  2$:      BIC     #BIT13,@VCCSR           ;DISABLE INTR.
```

```
                                ;;*****************************************************************
                                ;*TEST 7         TEST THAT "RESET" CLEARS CHARACTER STATUS REG.
                                ;;*****************************************************************
004630  000004                  TST7:   SCOPE
004632  005037  001124                  CLR     $GDDAT                          ;CLEAR EXPETED
004636  012777  036000  174602          MOV     #BIT13!BIT12!BIT11!BIT10,@VCCSR ;LOAD THE REGISTER
004644  000005                          RESET                                   ;CLEAR THE WORLD
004646  017737  174574  001126          MOV     @VCCSR,$BDDAT                   ;READ CHARACTER STATUS
004654  042737  141777  001126          BIC     #141777,$BDDAT                  ;MASK TO OTHER BITS
004662  001401                          BEQ     TST10           ;;BR IF ALL BITS CLEARED
004664  104003                          ERROR   3                               ;RESET FAILED TO CLEAR CHARACTER STATUS REGISTER
                                ;;*****************************************************************
                                ;*TEST 10        TEST THAT 'CLEAR LOW BYTE' DOES NOT CLEAR HIGH BYTE
                                ;;*****************************************************************
004666  000004                  TST10:  SCOPE
004670  012737  016000  001124          MOV     #16000,$GDDAT                   ;LOAD EXPECTED READ/WRITE RESULT
004676  013777  001124  174542          MOV     $GDDAT,@VCCSR                   ;LOAD THE REGISTER BITS
004704  105077  174536                  CLRB    @VCCSR                          ;CLEAR LOW BYTE
004710  017737  174532  001126          MOV     @VCCSR,$BDDAT                   ;READ THE RESULT OF 'CLRB'
004716  042737  140000  001126          BIC     #BIT15!BIT14,$BDDAT             ;MASK TO TOP TWO BITS
004724  023737  001124  001126          CMP     $GDDAT,$BDDAT                   ;COMPARE FOR SAME
004732  001401                          BEQ     TST11           ;;BR IF EXPECTED
004734  104003                          ERROR   3                               ;CLR LOW BYTE CHANGED THE
                                                                                ;HIGH BYTE OF THE CHAR STATUS REG.
```

```
                                ;;*****************************************************************
                                ;*TEST 11       TEST THAT 'VERT SYNC' FLAG CHANGES STATES
                                ;;*****************************************************************
004736  000004                  TST11:  SCOPE
004740  005077  174502                  CLR     @VCCSR                  ;ENSURE CLEAR REGISTER
004744  004737  015672                  JSR     PC,COUNTA               ;GO WAIT FOR A TRANSITION OF THE VERT SYNC FLAG
                                        ;NOW TEST THE RELATIVE TIME DIFFERENCE BETWEEN 'OFF' AND 'ON' STATES
004750  004737  015676                  JSR     PC,COUNT
004754  010137  001510                  MOV     R1,SAVE0                ;SAVE THE FIRST TIME
004760  004737  015676                  JSR     PC,COUNT
004764  010137  001514                  MOV     R1,SAVE2                ;SAVE THE SECOND TIME
004770  013737  001514  001126          MOV     SAVE2,$BDDAT            ;LOAD THE BIGGER TIME
004776  163737  001510  001126          SUB     SAVE0,$BDDAT            ;SUB THE FIRST TIME
005004  001001                        BNE     1$                      ;;BR IF NOT SAME
005006  104004                        ERROR   4                       ;NO TIME DIFFERENCE BETWEEN
005010  013737  001514  001126  1$:     MOV     SAVE2,$BDDAT            ;LOAD BIGGER TIME
005016  006237  001126                  ASR     $BDDAT                  ;DIVIDE BY 8
005022  006237  001126                  ASR     $BDDAT
005026  006237  001126                  ASR     $BDDAT
005032  023737  001126  001510          CMP     $BDDAT,SAVE0            ;TEST THAT MAGITUDE OF AT LEAST 8 BETWEEN THE TW
005040  101016                        BHI     2$                      ;;BR IF GREATER
005042  013737  001510  001126          MOV     SAVE0,$BDDAT            ;LOAD FIRST VALUE
005050  006237  001126                  ASR     $BDDAT                  ;ADJUST VALUE
005054  006237  001126                  ASR     $BDDAT
005060  006237  001126                  ASR     $BDDAT
005064  023737  001126  001514          CMP     $BDDAT,SAVE2            ;COMPARE TO SECOND READ
005072  101001                        BHI     2$                      ;BR IF MAGITUDE IS GREATER
005074  104004                        ERROR   4                       ;TIME DIFFERENCE BETWEEN OFF AND ON STATE WRONG
005076  000240                  2$:     NOP
```

```
                                ;;*****************************************************************
                                ;*TEST 12       TEST THE 'CHAR READY' FLAG USING THE "HOME" CODE
                                ;;*****************************************************************
005100  000004                  TST12:  SCOPE
005102  005077  174340                  CLR     @VCCSR                  ;CLEAR THE CHAR REG
005106  012737  100000  001124          MOV     #BIT15,$GDDAT           ;LOAD EXPECTED READ VALUE
005114  017737  174326  001126          MOV     @VCCSR,$BDDAT           ;READ THE STATUS REGISTER
005122  100401                        BMI     1$              ;;BR IF 'CHAR READY' IS SET
005124  104003                        ERROR   3               ;'CHAR READY' FAILED TO SET
                                                                ; BY LOADING A 'O' CHARACTER
                                ;NOW TEST THAT LOADING A "HOME" CHARACTER WILL CAUSE
                                ;"CHAR READY" TO CLEAR AND THEN SET AFTER A DELAY
005126  005037  001124          1$:     CLR     $GDDAT                  ;CLEAR EXPECTED READ VALVE
005132  112777  000035  174306          MOVB    #35,@VCCSR              ;LOAD A "HOME" CHARACTER
005140  017737  174302  001126          MOV     @VCCSR,$BDDAT           ;READ THE REGISTER
005146  100001                        BPL     2$              ;;BR IF 'CHAR READY' CLEARED
005150  104003                        ERROR   3               ;'CHAR READY' FAILED TO CLEAR WHEN LOADED
                                                                ;WITH A "HOME" ASCII CHARACTER
005152  012737  100000  001124  2$:      MOV     #BIT15,$GDDAT
005160  012700  100000                  MOV     #BIT15,R0               ;LOAD A DELAY FACTOR
005164  017737  174256  001126  3$:      MOV     @VCCSR,$BDDAT           ;READ THE REGISTER
005172  100403                        BMI     TST13           ;;BR IF THE BIT FINALLY SET
005174  005300                        DEC     R0              ;DELAY
005176  001372                        BNE     3$              ;BR IF NOT DONE
005200  104003                        ERROR   3               ;'CHAR READY' FAILED TO SET AFTER LOADING
                                                                ;A "PRINTABLE" CHARACTER.
```

```
                        ;;*********************************************************************
                        ;*TEST 13       TEST FOR 'VERT SYNC' INTERRUPT
                        ;;*********************************************************************
005202  000004          TST13:  SCOPE
005204  012746  000340          MOV     #340,-(SP)              ;LOAD PSW RETURN TO LEVEL 7
005210  012746  005216          MOV     #10$,-(SP)              ;LOAD RETURN P.C.
005214  000002                  RTI                             ;DO THIS TO BE LSI-11 COMPAT.
005216  012777  020000  174222  10$:    MOV     #BIT13,@VCCSR           ;SET INTR ENABLE
005224  004737  015672          JSR     PC,COUNTA               ;WAIT FOR A COMPLETE'VERT SYNC' CYCLE
005230  012777  005274  174232          MOV     #2$,@VCINT              ;LOAD INTR RETURN VECTOR
005236  012777  000340  174226          MOV     #340,@VCINT1            ;
005244  012700  000010                  MOV     #10,R0                  ;LOAD A SHORT DELAY COUNTER
005250  005046                  CLR     -(SP)                   ;LOAD PSW RETURN TO LEVEL 0
005252  012746  005260          MOV     #1$,-(SP)               ;LOAD RETURN P.C.
005256  000002                  RTI
005260  005300          1$:     DEC     R0                      ;DELAY
005262  001376                  BNE     1$                      ;BR IF NOT DONE
005264  005077  174156          CLR     @VCCSR
005270  104005                  ERROR   5                       ;'VERT SYNC' FAILED TO CAUSE AN INTR.
005272  000421                  BR      TST14           ;;BR OVER INTR HANDLER
                                ;RETURN HERE WITH PSW=7, LOWER PRIORITY AGAIN AND TEST FOR NO INTERRUPT AGAIN
005274  022626          2$:     CMP     (SP)+,(SP)+             ;ADJUST THE STACK BY 4
005276  012777  005332  174166          MOV     #4$,@VCINT1             ;RELOAD INTR VECTOR TO FALSE INTR HANDLER
005304  012700  000100                  MOV     #100,R0                 ;LOAD DELAY COUNTER
005310  005046                  CLR     -(SP)                   ;LOAD PSW RETURN LEVEL TO 0
005312  012746  005320          MOV     #3$,-(SP)               ;LOAD RETURN P.C.
005316  000002                  RTI
005320  005300          3$:     DEC     R0                      ;DELAY
005322  001376                  BNE     3$
005324  005077  174116          CLR     @VCCSR                  ;CLEAR INTR ENABLE
005330  000402                  BR      TST14           ;;
005332  022626          4$:     CMP     (SP)+,(SP)+             ;ADJUST STACK
005334  104005                  ERROR   5                       ;INTR DONE FAILED TO CLEAR INTR REQUEST
```

```
                                ;;*****************************************************************
                                ;*TEST 14       INTERRUPT LEVEL TEST FOR 'VERT SYNC' INTERRUPT
                                ;;*****************************************************************
005336  000004          TST14:  SCOPE
005340  012746  000340          MOV     #340,-(SP)              ;LOAD PSW RETURN TO LEVEL 7
005344  012746  005352          MOV     #10$,-(SP)              ;LOAD RETURN P.C.
005350  000002                  RTI                             ;DO THIS TO BE LSI-11 COMPAT.
005352  012777  020000  174066  10$:    MOV     #BIT13,@VCCSR           ;SET INTR ENABLE
005360  004737  015672          JSR     PC,COUNTA               ;WAIT FOR A COMPLETE 'VERT SYNC' CYCLE
005364  012777  005444  174076          MOV     #2$,@VCINT              ;LOAD INTR RETURN VECTOR
005372  012777  000340  174072          MOV     #340,@VCINT1            ;
005400  012700  000010                  MOV     #10,R0                  ;LOAD A SHORT DELAY COUNTER
005404  113737  001243  001516          MOVB    $VECT1+1,SAVE3          ;GET BR LEVEL
005412  042737  177437  001516          BIC     #177437,SAVE3           ;MASK OUT BITS
005420  013746  001516          MOV     SAVE3,-(SP)             ;LOAD BR LEVEL
005424  012746  005432          MOV     #1$,-(SP)               ;LOAD RETURN P.C.
005430  000002                  RTI
005432  005300          1$:     DEC     R0                      ;DELAY
005434  001376          BNE     1$                      ;BR IF NOT DONE
005436  005077  174004          CLR     @VCCSR
005442  000404          BR      5$                      ;;BR OVER INTR HANDLER
                        ;RETURN HERE IF AN INTERRUPT OCCURRED  **  ERROR **
005444  022626          2$:     CMP     (SP)+,(SP)+             ;ADJUST THE STACK BY 4
005446  005077  173774          CLR     @VCCSR
005452  104005                  ERROR   5                       ;VERT SYNC INTERRUPTED IN ERROR
                                                                ;IS BR LEVEL CORRECT ?
005454  012777  005512  174006  5$:     MOV     #4$,@VCINT              ;RELOAD INTR VECTOR
005462  012700  000100          MOV     #100,R0                 ;LOAD DELAY COUNTER
005466  005046                  CLR     -(SP)                   ;LOAD PSW RETURN LEVEL TO 0
005470  012746  005476          MOV     #3$,-(SP)               ;LOAD RETURN P.C.
005474  000002                  RTI
005476  005300          3$:     DEC     R0                      ;DELAY
005500  001376          BNE     3$
005502  005077  173740          CLR     @VCCSR                  ;CLEAR INTR ENABLE
005506  104005                  ERROR   5                       ;LOWERING PROIORITY FAILED TO CAUSE AN INTERRUPT
005510  000401          BR      6$                      ;;
005512  022626          4$:     CMP     (SP)+,(SP)+             ;ADJUST STACK
005514  005046          6$:     CLR     -(SP)
005516  012746  005524          MOV     #7$,-(SP)
005522  000002                  RTI
005524  000240          7$:     NOP
```

```
                                ;;*****************************************************************
                                ;*TEST 15       DYNAMIC TESTING OF THE X CROSS HAIR POSITION REGISTERS
                                ;;*****************************************************************
005526  000004                  TST15:  SCOPE
005530  005737  001544                  TST     BURN                    ;TEST IF RUNNING IN "BURN-IN" MODE
005534  001406                          BEQ     3$                      ;BR IF NOT
005536  013777  001546  174004          MOV     COAXSW,@COAX            ;LOAD THE RELAY
005544  004537  016666                  JSR     R5,DELAY                ;LET THE RELAY SETTLE
005550  000012                          10.
005552                          3$:
005552  005737  001200                  TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
005556  001427                          BEQ     TST16           ;;BR IF FIRST PASS
005560  032777  002000  173352          BIT     #SW10,@SWR              ;TEST IF INHIBIT VISUAL CHAR. PATTERNS
005566  001023                          BNE     TST16           ;;BR IF INHIBIT IS SET
005570  012777  010000  173650  2$:     MOV     #BIT12,@VCCSR           ;ENABLE X CROSS HAIRS
005576  005037  001124                  CLR     $GDDAT                  ;CLEAR EXPECTED VALUE
005602  005077  173642                  CLR     @VCHRLO                 ;CLEAR POS.
005606  113777  001124  173634  1$:     MOVB    $GDDAT,@VCHRLO          ;LOAD THE LOW BYTE (X POSITION)
005614  004537  016666                  JSR     R5,DELAY
005620  000001                          1
005622  005237  001124                  INC     $GDDAT                  ;UPDATE X POSITION
005626  023737  001124  001536          CMP     $GDDAT,XHAIR            ;TEST IF MORE LINES?
005634  001364                          BNE     1$
                                ;;*****************************************************************
                                ;*TEST 16       DYNAMIC TESTING OF THE Y CROSS HAIR POSITION REGISTERS
                                ;;*****************************************************************
005636  000004                  TST16:  SCOPE
005640  005737  001200                  TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
005644  001431                          BEQ     TST17           ;;BR IF FIRST PASS
005646  032777  002000  173264          BIT     #SW10,@SWR              ;TEST IF INHIBIT VISUAL CHAR. PATTERNS
005654  001025                          BNE     TST17           ;;BR IF INHIBIT IS SET
005656  012777  004000  173562          MOV     #BIT11,@VCCSR           ;CNABLE Y CROSS HAIRS
005664  005037  001124                  CLR     $GDDAT
005670  005077  173554                  CLR     @VCHRLO                 ;CLEAR POSITION
005674  113777  001124  173550  1$:     MOVB    $GDDAT,@VCHRHI
005702  004537  016666                  JSR     R5,DELAY
005706  000001                          1
005710  105237  001124                  INCB    $GDDAT
005714  123737  001540  001124          CMPB    YHAIR,$GDDAT
005722  001364                          BNE     1$
005724  005077  173516                  CLR     @VCCSR                  ;DISABLE CROSS HAIRS
```

```
1085                                    ;;*****************************************************************
1086                                    ;*TEST 17       FULL SCREEN OF A CHARACTER
1087                                    ;;*****************************************************************
1088  005730  000004                    TST17:  SCOPE
1089  005732  005737  001200                    TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
1090  005736  001413                            BEQ     TST20           ;;BR IF FIRST PASS
1091  005740  032777  002000  173172            BIT     #SW10,@SWR              ;TEST IF INHIBIT VISUAL CHAR. PATTERNS
1092  005746  001007                            BNE     TST20           ;;BR IF INHIBIT IS SET
1093  005750  004737  017256                    JSR     PC,HOME                 ;HOME AND ERASE THE SCREEN
1094  005754  004737  016076                    JSR     PC,FILLWC               ;FILL SCREEN WITH A 'E'S
1095  005760  004537  016666                    JSR     R5,DELAY
1096  005764  000144                            100.
1097
1098                                    ;;*****************************************************************
1099                                    ;*TEST 20       SINGLE CHARACTER ACROSS ALL COLS. <ALL CHARACTERS>
1100                                    ;;*****************************************************************
1101  005766  000004                    TST20:  SCOPE
1102  005770  005737  001200                    TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
1103  005774  001446                            BEQ     TST21           ;;BR IF FIRST PASS
1104  005776  032777  002000  173134            BIT     #SW10,@SWR              ;TEST IF INHIBIT VISUAL CHAR. PATTERNS
1105  006004  001042                            BNE     TST21           ;;BR IF INHIBIT IS SET
1106  006006  004737  017256                    JSR     PC,HOME                 ;HOME AND ERASE THE SCREEN
1107  006012  012737  000040  001530  3$:       MOV     #40,STCHAR              ;SET-UP STARTING CHARACTER
1108
1109  006020  013737  001524  001534            MOV     VHO,TEMPO               ;LOAD COUNT
1110  006026  013701  001530          1$:       MOV     STCHAR,R1               ;LOAD R1= TO CHARACTER
1111  006032  004737  016132                    JSR     PC,FILBUF               ;LOAD A BUFFER WITH THAT CHARACTER
1112
1113  006036  004737  016032                    JSR     PC,XPRNT                ;DISPLAY A FULL LINE FROM THE BUFFER
1114
1115  006042  005337  001534                    DEC     TEMPO                   ;DONE ?
1116  006046  100010                            BPL     2$                      ;FINISHED
1117  006050  004537  016666                    JSR     R5,DELAY
1118  006054  000144                            100.
1119  006056  004737  017256                    JSR     PC,HOME                 ;HOME AND ERASE THE SCREEN
1120  006062  013737  001524  001534            MOV     VHO,TEMPO
1121  006070  005237  001530          2$:       INC     STCHAR                  ;UPDATE THE CHARACTER
1122  006074  023737  001532  001530            CMP     LASTCH,STCHAR           ;TEST FOR FINAL CHARACTER
1123  006102  001351                            BNE     1$                      ;BRANCH IF NOT COMPLETED
1124
1125  006104  004537  016666                    JSR     R5,DELAY
1126  006110  000144                            100.
1127
```

```
                                ;;*****************************************************************
                                ;*TEST 21       ROTATING CHARACTERS ACROSS ALL COLS. (ALL CHARACTERS)
                                ;;*****************************************************************
006112  000004                  TST21:  SCOPE
006114  005737  001200                  TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
006120  001451                          BEQ     TST22           ;;BR IF FIRST PASS
006122  032777  002000  173010          BIT     #SW10,@SWR              ;TEST IF INHIBIT VISUAL CHAR. PATTERNS
006130  001045                          BNE     TST22           ;;BR IF INHIBIT IS SET
006132  004737  017256                  JSR     PC,HOME                 ;HOME AND ERASE THE SCREEN
006136  012737  000040  001530  3$:     MOV     #40,STCHAR              ;SET-UP STARTING CHARACTER

006144  004737  017256                  JSR     PC,HOME                 ;HOME AND ERASE THE SCREEN
006150  013737  001524  001534          MOV     VHO,TEMPO               ;LOAD TEMP
006156  013701  001530          1$:     MOV     STCHAR,R1               ;LOAD R1=TO CHARACTER
006162  004537  016166                  JSR     R5,LIC                  ;LOAD A BUFFER STARTING WITH
006166  001522                          WIDTH                           ; THAT CHARACTER AND WIDTH (BYTE)

006170  004737  016032                  JSR     PC,XPRNT                ;DISPLAY A FULL LINE FROM THE BUFFER

006174  005337  001534                  DEC     TEMPO                   ;DONE ?
006200  100010                          BPL     2$                      ;BR IF YES
006202  004537  016666                  JSR     R5,DELAY
006206  000144                          100.
006210  004737  017256                  JSR     PC,HOME                 ;HOME AND ERASE THE SCREEN
006214  013737  001524  001534          MOV     VHO,TEMPO
006222  005237  001530          2$:     INC     STCHAR                  ;UPDATE THE STARTING CHARACTER
006226  023737  001532  001530          CMP     LASTCH,STCHAR           ;TEST FOR FINAL CHARACTER
006234  001350                          BNE     1$                      ;BRANCH IF NOT COMPLETED

006236  004537  016666                  JSR     R5,DELAY
006242  000144                          100.
```

```
1159                                    ;;*****************************************************************
1160                                    ;*TEST 22       DIRECT CURSOR ADDRESS TEST
1161                                    ;;*****************************************************************
1162  006244  000004                    TST22:  SCOPE
1163  006246  005737  001200                    TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
1164  006252  001530                            BEQ     TST23           ;;BR IF FIRST PASS
1165  006254  032777  002000  172656            BIT     #SW10,@SWR              ;TEST IF INHIBIT VISUAL CHAR. PATTERNS
1166  006262  001124                            BNE     TST23           ;;BR IF INHIBIT IS SET
1167  006264  004737  017256                    JSR     PC,HOME                 ;HOME AND ERASE THE SCREEN
1168  006270  012737  123456  017704  DCATST:  MOV     #123456,$LONUM  ;PRIME RANDOM NUMBER GENERATOR
1169  006276  012737  176543  017702            MOV     #176543,$HINUM
1170  006304  013737  001520  017152            MOV     TOTALC,OVRAL    ;LOAD CHAR COUNT
1171  006312  013737  001524  017150            MOV     VHO,SET         ;LOAD LINE COUNT
1172  006320  012700  024350                    MOV     #BUFFER+20,R0   ;LOAD DESTINATION BUFFER
1173  006324  012701  017154          2$:       MOV     #MSGTXT,R1      ;LOAD MESSAGE POINTER
1174  006330  012120                  1$:       MOV     (R1)+,(R0)+     ;LOAD 2 CHARACTERS
1175  006332  022701  017254                    CMP     #MSGTND,R1      ;TEST FOR LAST CHAR
1176  006336  001374                            BNE     1$              ;BR UNTIL DONE 1 LINE
1177  006340  005337  017150                    DEC     SET             ;FINISHED ALL LINES
1178  006344  100367                            BPL     2$              ;BR IF NOT
1179  006346  012737  177777  024330            MOV     #-1,BUFFER      ;LOAD MESSAGE TERMINATOR
1180  006354  004737  017604          GENER:    JSR     PC,$RAND        ;GENERATE RANDOM NUMBER
1181  006360  013700  017702                    MOV     $HINUM,R0       ;GET RANDOM NUMBER
1182  006364  042700  177740                    BIC     #177740,R0      ;RANDOM NO. MUST BE TWO DIGITS
1183  006370  020037  001524                    CMP     R0,VHO          ;NO, MUST NOT BE GREATER THAN  VHO
1184  006374  101367                            BHI     GENER           ;GREATER, REGENERATION
1185  006376  010037  017144                    MOV     R0,YADDS        ;STORE RANDOM Y COORDINATE
1186  006402  012737  024350  017150            MOV     #BUFFER+20,SET  ;LOAD BASE POINTER
1187  006410  010001                            MOV     R0,R1
1188  006412  001405                            BEQ     GENRX           ;RESULT, MINIMUM Y COORDINATE
1189  006414  063737  001522  017150  1$:       ADD     WIDTH,SET       ;SETUP  Y INDEX LOCATION FOR PRINTOUT
1190  006422  005301                            DEC     R1
1191  006424  001373                            BNE     1$              ;Y COORDINATE IS SET
1192  006426  004737  017604          GENRX:    JSR     PC,$RAND        ;GENERATE RANDOM NUMBER
1193  006432  013700  017702                    MOV     $HINUM,R0       ;GET A RANDOM NUMBER
1194  006436  042700  177700                    BIC     #177700,R0      ;RANDOM NO. MAY BE LESS THAN 200
1195  006442  010037  017146                    MOV     R0,XADDS        ;STORE RANDOM X COORDINATE
1196  006446  060037  017150                    ADD     R0,SET          ;SETUP X COOR, FOR PNTOUT.
1197  006452  013701  017150                    MOV     SET,R1          ;SETUP CHECK
1198  006456  105711                            TSTB    (R1)            ;HAS CURRENT CHAR, ALREADY BEEN USED?
1199  006460  100735                            BMI     GENER           ;YES, REGENERATE
1200  006462  113777  017144  172766            MOVB    YADDS,@VCPOSH   ;LOAD Y COORDINATE
1201  006470  113777  017146  172756            MOVB    XADDS,@VCPOS    ;LOAD X COORDINATE
1202  006476  111137  024330                    MOVB    (R1),BUFFER     ;LOAD CHARACTER TO BE PRINTED
1203  006502  152711  000200                    BISB    #200,(R1)       ;INDICATE USE OF CURSOR POSITION
1204  006506  004737  016032                    JSR     PC,XPRNT        ;EXECUTE AND PRINT CHARACTER
1205  006512  104407                            CKSWR                   ;TEST FOR CTRL G
1206  006514  005337  017152                    DEC     OVRAL           ;MAXIMUM NO. OF COORDINATES
1207  006520  001315                            BNE     GENER           ;BR BACK UNTIL DONE
1208  006522  004537  016666                    JSR     R5,DELAY
1209  006526  000144                            100.
1210  006530  004737  017256                    JSR     PC,HOME                 ;HOME AND ERASE THE SCREEN
```

```
1211                                    ;;*****************************************************************
1212                                    ;*TEST 23       CURSOR MOTION TEST
1213                                    ;;*****************************************************************
1214  006534  000004                    TST23:  SCOPE
1215  006536  005737  001200                    TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
1216  006542  001562                            BEQ     TST24           ;;BR IF FIRST PASS
1217  006544  032777  002000  172366            BIT     #SW10,@SWR              ;TEST IF INHIBIT VISUAL CHAR. PATTERNS
1218  006552  001156                            BNE     TST24           ;;BR IF INHIBIT IS SET
1219  006554  004737  017256                    JSR     PC,HOME                 ;HOME AND ERASE THE SCREEN
1220  006560  042777  002000  172660            BIC     #BIT10,@VCCSR           ;ENABLE CURSOR
1221
1222                                    ;ROUTINE TO LOAD REFERENCE LINES FOR CURSOR MOTION TEST
1223
1224  006566  012700  024330            LBMT:   MOV     #BUFFER,R0      ;LOAD POINTER
1225  006572  013701  001526                    MOV     VH1,R1          ;LOAD R1
1226  006576  005301                            DEC     R1
1227  006600  004737  006676                    JSR     PC,MOVDN1       ;MOVE CURSOR DOWN
1228  006604  004737  006714                    JSR     PC,MOVRIG       ;MOVE RIGHT
1229  006610  112720  000062                    MOVB    #62,(R0)+       ;LOAD #2
1230  006614  004737  006714                    JSR     PC,MOVRIG       ;MOVE RIGHT
1231  006620  004737  006714                    JSR     PC,MOVRIG       ;MOVE RIGHT
1232  006624  112720  000040                    MOVB    #40,(R0)+
1233  006630  112720  000061                    MOVB    #61,(R0)+       ;LOAD #1
1234  006634  004737  006672                    JSR     PC,MOVDWN       ;MOVE DOWN
1235  006640  004737  006714                    JSR     PC,MOVRIG       ;MOVE RIGHT
1236  006644  112720  000063                    MOVB    #63,(R0)+       ;LOAD #3
1237  006650  004737  006714                    JSR     PC,MOVRIG
1238  006654  004737  006714                    JSR     PC,MOVRIG       ;MOVE RIGHT
1239  006660  112720  000064                    MOVB    #64,(R0)+       ;LOAD #4
1240  006664  112710  000377                    MOVB    #377,(R0)       ;TERM
1241  006670  000420                            BR      LBMT1           ;;BR TO NEXT PART
1242
1243  006672  013701  001526            MOVDWN: MOV     VH1,R1
1244  006676  112720  000015            MOVDN1: MOVB    #15,(R0)+       ;LOAD CR
1245  006702  112720  000012                    MOVB    #12,(R0)+       ;LOAD LF
1246  006706  005301                            DEC     R1
1247  006710  001372                            BNE     MOVDN1          ;LOOP UNTIL DONE
1248  006712  000207                            RTS     PC              ;ESIT
1249
1250  006714  012701  000016            MOVRIG: MOV     #16,R1          ;LOAD R1
1251  006720  112720  000040            1$:     MOVB    #40,(R0)+       ;LOAD SPACES
1252  006724  005301                            DEC     R1
1253  006726  100374                            BPL     1$              ;LOOP UNTIL DONE
1254  006730  000207                            RTS     PC              ;EXIT
1255
1256  006732  004737  016032            LBMT1:  JSR     PC,XPRNT        ;DISPLAY THIS LINE
1257  006736  004537  016666                    JSR     R5,DELAY
1258  006742  000144                            100.
1259
```

```
                                ;CURSOR MOTION SUBROUTINE
006744  013701  001526  COM:    MOV     VH1,R1          ;LOAD COUNT
006750  012700  024330          MOV     #BUFFER,R0      ;LOAD BUFFER POINTER
006754  112720  000032  1$:     MOVB    #32.,(R0)+      ;LOAD A CURSOR UP
006760  005301                  DEC     R1
006762  001374                  BNE     1$              ;LOOP UNTIL DONE
006764  112720  000130          MOVB    #130,(R0)+      ;LOAD 'X'
006770  012701  000040          MOV     #40,R1          ;LOAD COUNT
006774  112720  000010  2$:     MOVB    #10,(R0)+       ;LOAD "BACKSPACE (CURSOR LEFT)
007000  005301                  DEC     R1              ;DONE ALL ?
007002  100374                  BPL     2$              ;BR IF NOT
007004  112720  000130          MOVB    #130,(R0)+      ;LOAD 'X'
007010  112720  000010          MOVB    #10,(R0)+       ;LOAD BACKSPACE
007014  013701  001526          MOV     VH1,R1          ;LOAD COUNT
007020  112720  000013  3$:     MOVB    #13,(R0)+       ;LOAD CURSOR DOWN
007024  005301                  DEC     R1              ;DONE ?
007026  001374                  BNE     3$              ;BR IF NOT
007030  112720  000130          MOVB    #130,(R0)+      ;LOAD 'X'
007034  112720  000010          MOVB    #10,(R0)+       ;LOAD BACKSPACE
007040  012701  000036          MOV     #36,R1          ;LOAD COUNT
007044  112720  000030  4$:     MOVB    #30,(R0)+       ;LOAD 'C' CURSOR RIGHT
007050  005301                  DEC     R1
007052  100374                  BPL     4$              ;LOOP UNTIL DONE
007054  112720  000130          MOVB    #130,(R0)+      ;LOAD 'X'
007060  112720  000377          MOVB    #377,(R0)+
007064  004737  016032          JSR     PC,XPRNT        ;DISPLAY THIS LINE
007070  004537  016666          JSR     R5,DELAY
007074  000144                  100.
007076  004737  017256          JSR     PC,HOME                 ;HOME AND ERASE THE SCREEN
007102  052777  002000  172336  BIS     #BIT10,@VCCSR           ;DISABLE CHAR. CURSOR

                        ;;**********************************************************************
                        ;*TEST 24
                        ;;**********************************************************************
007110  000004          TST24:  SCOPE
```

```
                                NOCHAR: NOP
                                        MOV     $GDADR,TEMP1            ;GET BASE ADDRESS
                                        ADD     #20,TEMP1               ;UPDATE TO THE MAP ADDRESS
                                        MOV     $CDW1,DEVTMP            ;GET THE NUMBER OF MAPS SELECTED
                                        BIC     #177700,DEVTMP          ;MASK TO LOWER SIX BITS
                                        BEQ     MAPRTA                  ;BR IF NO MAPS SELECTED
                                        CLR     $UNIT                   ;CLEAR MAP INDICATOR
                                        MOV     #BIT0,TEMP3             ;LOAD TESTING BIT
                                MAPRTB: BIT     TEMP3,DEVTMP            ;TEST IF THIS BIT MAP IS SELECTED
                                        BEQ     MAPRET                  ;BR IF NOT
                                        JMP     NUMBR                   ;SELECTED - TEST THIS MAP
                                MAPRET: ADD     #20,TEMP1               ;UPDATE TO NEXT BUS ADDRESS
                                        INC     $UNIT                   ;UPDATE MAP INDICATOR
                                        ASL     TEMP3                   ;MOVE THE TEST BIT
                                        CMP     #100,TEMP3              ;TEST IF ANY MORE POSSIBLE MAPS
                                        BNE     MAPRTB                  ;BR IF MORE
                                        .SBTTL  MULTIPLE MAP PATTERN
                                        TST     $PASS                   ;TEST IF 1ST PASS
                                        BEQ     MAPRTA                  ;BR IF FIRST PASS
                                        JSR     PC,LODADR               ;LOAD THE BUS ADDRESS
                                        MOV     $CDW1,10$               ;GET THE NUMBER OF MAPS
                                        BIC     #177700,10$             ;MASK
                                        MOV     #DUALPL,R0              ;LOAD POINTER
                                1$:     TST     10$                     ;TEST IF ANY EXIST
                                        BEQ     4$                      ;BR IF DONE
                                        ASR     10$                     ;TEST FOR NEXT MAP
                                        BCC     2$                      ;BR IF NEXT NOT SELECTED
                                        JSR     PC,CLRMAP               ;CLEAR THE MAP
                                        MOVB    (R0)+,11$               ;GET COLOR VALUE
                                        MOV     11$,@VGCOLR             ;LOAD THE COLOR FOR THIS MAP
                                        MOVB    (R0)+,@VGCSR            ;LOAD THE ORGIN FOR THIS MAP
                                        BIS     #BIT8,@VGCSR            ;ENABLE MAP
                                        BR      3$
                                2$:     TST     (R0)+                   ;ADJUST POINTER
                                3$:     JSR     PC,MOVADR               ;LOAD ADR OF NEXT MAP
                                        BR      1$
                                4$:     JSR     R5,DELAY
                                        100.
                                        BR      MAPRTA
                                10$:    0
                                11$:    0

                                DUALPL: .BYTE   3,5                     ;MAP #0 COLOR AND ORGIN
                                        .BYTE   14.6                    ;MAP #1 COLOR AND ORGIN
                                        .BYTE   60.1                    ;MAP #2
                                        .BYTE   33.2                    ;MAP #3
                                        .BYTE   17.15                   ;MAP #4
                                        .BYTE   63.16                   ;MAP #5

                                MAPRTA: JMP     @RETURN

                                RETURN: 0                               ;RETURN CONTROL
```

```
                                        ;THE BIT MAP ADDRESS IS IN "TEMP1" - LOAD THE ADDRESS AND
                                        ;       START TESTING THAT BIT MAP
                                        ;
007370  013737  001502  001460 NUMBR:  MOV     TEMP1,VGCSR             ;LOAD BUS ADDRESSES
007376  013737  001502  001462         MOV     TEMP1,VGPC
007404  013737  001502  001464         MOV     TEMP1,VGBUF
007412  013737  001502  001466         MOV     TEMP1,VGCOLR
007420  062737  000002  001462         ADD     #2,VGPC
007426  062737  000004  001464         ADD     #4,VGBUF
007434  062737  000010  001466         ADD     #10,VGCOLR
007442  012737  000024  001102         MOV     #$TN-1,$TSTNM           ;LOAD TEST NUMBER

                                        ;;*****************************************************************
                                        ;*TEST 25       TEST THAT 'EXPAND' BIT CAN BE SET
                                        ;;*****************************************************************
007450  000004                 TST25:  SCOPE
007452  012737  004000  001124         MOV     #BIT11,$GDDAT           ;LOAD THE EXPECTED
007460  013777  001124  171772         MOV     $GDDAT,@VGCSR           ;LOAD THE REGISTER
007466  017737  171766  001126         MOV     @VGCSR,$BDDAT           ;READ THE REGISTER
007474  042737  171360  001126         BIC     #171360,$BDDAT          ;MASK TO BITS
007502  023737  001124  001126         CMP     $GDDAT,$BDDAT           ;COMPARE THE EXPECTED TO RECVD
007510  001401                       BEQ     TST26           ;;BR IF SET
007512  104006                       ERROR   6                       ;'EXPAND' BIT FAILED TO SET

                                        ;;*****************************************************************
                                        ;*TEST 26       TEST THAT 'MONO' BIT CAN BE SET
                                        ;;*****************************************************************
007514  000004                 TST26:  SCOPE
007516  012737  002000  001124         MOV     #BIT10,$GDDAT           ;LOAD THE EXPECTED
007524  013777  001124  171726         MOV     $GDDAT,@VGCSR           ;LOAD THE REGISTER
007532  017737  171722  001126         MOV     @VGCSR,$BDDAT           ;READ THE REGISTER
007540  042737  171360  001126         BIC     #171360,$BDDAT          ;MASK TO BITS
007546  023737  001124  001126         CMP     $GDDAT,$BDDAT           ;COMPARE THE EXPECTED TO RECVD
007554  001401                       BEQ     TST27           ;;BR IF SET
007556  104006                       ERROR   6                       ;'MONO' BIT FAILED TO SET

                                        ;;*****************************************************************
                                        ;*TEST 27       TEST THAT 'MAP ENABLE' BIT CAN BE SET
                                        ;;*****************************************************************
007560  000004                 TST27:  SCOPE
007562  012737  000400  001124         MOV     #BIT8,$GDDAT            ;LOAD THE EXPECTED
007570  013777  001124  171662         MOV     $GDDAT,@VGCSR           ;LOAD THE REGISTER
007576  017737  171656  001126         MOV     @VGCSR,$BDDAT           ;READ THE REGISTER
007604  042737  171360  001126         BIC     #171360,$BDDAT          ;MASK TO BITS
007612  023737  001124  001126         CMP     $GDDAT,$BDDAT           ;COMPARE THE EXPECTED TO RECVD
007620  001401                       BEQ     TST30           ;;BR IF SET
007622  104006                       ERROR   6                       ;MAP ENABLE FAILED TO SET
```

```
                                        ;;*****************************************************************
                                        ;*TEST 30       TEST THAT 'ORGIN POINT' BITS CAN BE SET
                                        ;;*****************************************************************
007624  000004                  TST30:  SCOPE
007626  012737  007642  001110          MOV     #1$,$LPERR
007634  012737  000001  001124          MOV     #BIT0,$GDDAT            ;LOAD THE EXPECTED
007642  013777  001124  171610  1$:     MOV     $GDDAT,@VGCSR           ;LOAD THE REGISTER
007650  017737  171604  001126          MOV     @VGCSR,$BDDAT           ;READ THE REGISTER
007656  042737  171360  001126          BIC     #171360,$BDDAT          ;MASK TO BITS
007664  023737  001124  001126          CMP     $GDDAT,$BDDAT           ;COMPARE THE EXPECTED TO RECVD
007672  001401                          BEQ     2$              ;;BR IF SET
007674  104006                          ERROR   6                       ;'ORGIN POINT' BIT FAILED TO SET
007676  005237  001124          2$:     INC     $GDDAT                  ;UPDATE EXPECTED VALUE OF 'ORGIN POINT'
007702  022737  000020  001124          CMP     #20,$GDDAT              ;TEST IF VALID VALUE FOR 'ORGIN'
007710  001354                          BNE     1$                      ;BR IF MORE TO TEST
                                        ;;*****************************************************************
                                        ;*TEST 31       TEST THAT CLEAR LOW BYTE DOES NOT CLEAR HIGH BYTE
                                        ;;*****************************************************************
007712  000004                  TST31:  SCOPE
007714  012737  006400  001124          MOV     #BIT11!BIT10!BIT8,$GDDAT
007722  012777  006417  171530          MOV     #BIT11!BIT10!BIT8+17,@VGCSR
007730  105077  171524                  CLRB    @VGCSR                  ;CLEAR LOW BYTE
007734  017737  171520  001126          MOV     @VGCSR,$BDDAT           ;READ THE REGISTER
007742  042737  170360  001126          BIC     #170360,$BDDAT          ;MASK TO BITS
007750  023737  001124  001126          CMP     $GDDAT,$BDDAT           ;TEST IF SAME
007756  001401                          BEQ     TST32           ;;BR IF SAME
007760  104006                          ERROR   6                       ;CLEARING LOW BYTE OF STATUS CHANGED THE HIGH BY
                                        ;;*****************************************************************
                                        ;*TEST 32       TEST THAT CLEAR HIGH BYTE DOES NOT CLEAR LOW BYTE
                                        ;;*****************************************************************
007762  000004                  TST32:  SCOPE
007764  012737  000017  001124          MOV     #17,$GDDAT              ;LOAD EXPECTED READ VALUE
007772  012777  006417  171460          MOV     #BIT11!BIT10!BIT8+17,@VGCSR             ;LOAD STATUS REGISTER
010000  013700  001460                  MOV     VGCSR,R0                ;MAKE ADDRESS
010004  005200                          INC     R0                      ;OF HIGH BYTE
010006  105010                          CLRB    (R0)                    ;CLEAR HIGH BYTE
010010  017737  171444  001126          MOV     @VGCSR,$BDDAT           ;READ REGISTER
010016  042737  170360  001126          BIC     #170360,$BDDAT          ;MASK OUT BITS
010024  023737  001124  001126          CMP     $GDDAT,$BDDAT           ;COMPARE EXPECT TO RCVD
010032  001401                          BEQ     TST33           ;;BR IF SAME
010034  104006                          ERROR   6                       ;CLEARING THE HIGH BYTE OF STATUS CHANGED
                                                                        ;THE LOW BYTE
                                        ;;*****************************************************************
                                        ;*TEST 33       TEST THAT "RESET" CLEARS THE BIT MAP STATUS REGISTER
                                        ;;*****************************************************************
010036  000004                  TST33:  SCOPE
010040  005037  001124                  CLR     $GDDAT                  ;LOAD EXPECTED
010044  012777  006417  171406          MOV     #BIT11!BIT10!BIT8!17,@VGCSR     ;LOAD THE STATUS REGISTER
010052  000005                          RESET                           ;RESET THE WORLD
010054  017737  171400  001126          MOV     @VGCSR,$BDDAT           ;READ THE REGISTER
010062  042737  171360  001126          BIC     #171360,$BDDAT          ;MASK TO OTHER BITS
010070  001401                          BEQ     TST34           ;;BR IF CLEARED
010072  104006                          ERROR   6                       ;RESET FAILED TO CLEAR BIT MAP STATUS REGISTER
```

```
                                        ;;*****************************************************************
                                        ;*TEST 34       TEST MAP READY AND CLEAR MAP BITS
                                        ;;*****************************************************************
010074  000004                          TST34:  SCOPE
                                        ;TEST THAT WRITTING BIT 9 (CLEAR MAP) CLEARS MAP READY (BIT 7)
010076  005037  001124                          CLR     $GDDAT                  ;CLEAR EXPECTED
010102  005037  001126                          CLR     $BDDAT                  ;CLEAR RESULTS
010106  004537  016666                          JSR     R5,DELAY                ;WAIT FOR VERT SYNC
010112  100001                                  BIT15!1
010114  052777  001000  171336                  BIS     #BIT9,@VGCSR            ;SET "CLEAR MAP" BIT
010122  117737  171332  001126                  MOVB    @VGCSR,$BDDAT           ;READ VG STATUS REG
010130  100001                                  BPL     1$              ;;BR IF CLEARED
010132  104014                                  ERROR   14                      ;BIT MAP READY NOT SET

                                        ;TEST "CLEAR MAP" BIT SETS

010134  012737  001000  001124  1$:     MOV     #BIT9,$GDDAT            ;LOAD EXPECTED
010142  004537  016666                  JSR     R5,DELAY                ;WAIT FOR VERT SYNC
010146  100001                          BIT15!BIT0
010150  017737  171304  001126          MOV     @VGCSR,$BDDAT           ;READ MAP STATUS REG.
010156  033737  001124  001126          BIT     $GDDAT,$BDDAT           ;TEST IF BIT IS SET
010164  001001                          BNE     2$              ;;BR IF SET
010166  104014                          ERROR   14                      ;CLEAR MAP BIT FAILED TO SET

                                        ;TEST THAT "MAP READY" CLEARED

010170  005037  001124  2$:     CLR     $GDDAT                  ;CLEARED EXPECTED
010174  105737  001126          TSTB    $BDDAT                  ;TEST BIT 7
010200  100001                          BPL     3$              ;;BR IF CLEARED
010202  104014                          ERROR   14                      ;SETTING "CLEAR MAP" BIT FAILED TO CLEAR "MAP RE

                                        ;TEST THAT MAP READY RETURNS AFTER 2 VERT SYNC TIMES

010204  004537  016666  3$:     JSR     R5,DELAY                        ;WAIT FOR VERT SYNC
010210  100002                          BIT15!2
010212  012737  000200  001124          MOV     #BIT7,$GDDAT            ;LOAD EXPECTED
010220  017737  171234  001126          MOV     @VGCSR,$BDDAT           ;READ STATUS
010226  033737  001124  001126          BIT     $GDDAT,$BDDAT           ;TEST IF BIT IS SET
010234  001001                          BNE     4$              ;;BR IS SET
010236  104014                          ERROR   14                      ;MAP READY FAILED TO SET AFTER CLEAR MAP

                                        ;TEST THAT "CLEAR MAP" BIT WAS CLEARED

010240  005037  001124  4$:     CLR     $GDDAT                  ;CLEAR EXPECTED
010244  032737  001000  001126          BIT     #BIT9,$BDDAT            ;TEST FOR CLEARED BIT
010252  001401                          BEQ     TST35           ;;BR IF CLEARED
010254  104014                          ERROR   14                      ;MAP READY SET BUT "CLEAR MAP" BIT FAILED TO CLE
```

```
1497
1498                                    ;;*****************************************************************
1499                                    ;*TEST 35       READ-WRITE TEST OF THE LOW 3 BITS OF THE MAP P.C.
1500                                    ;;*****************************************************************
1501  010256  000004                    TST35:  SCOPE
1502  010260  012737  010276  001110            MOV     #1$,$LPERR
1503  010266  005037  001124                    CLR     $GDDAT                  ;CLEAR EXPECTED READ VALUE
1504  010272  005037  001474                    CLR     $TEMP                   ;CLEAR WRITE VALUE
1505  010276  013777  001474  171156  1$:      MOV     $TEMP,@VGPC             ;LOAD BIT MAP P.C.
1506  010304  017737  171150  001126            MOV     @VGCSR,$BDDAT           ;READ STATUS (BIT MAP)
1507  010312  042737  177617  001126            BIC     #177617,$BDDAT          ;MASK TO UNUSED BITS
1508  010320  023737  001124  001126            CMP     $GDDAT,$BDDAT           ;TEST IF SAME
1509  010326  001401                            BEQ     2$              ;;BR IF SAME
1510  010330  104007                            ERROR   7                       ;BIT MAP P.C. DID NOT LOAD
1511                                                                            ;CORRECTLY
1512  010332  062737  000020  001124  2$:      ADD     #20,$GDDAT              ;UPDATE EXPECTED READ VALUE
1513  010340  005237  001474                    INC     $TEMP                   ;UPDATE EXPECTED WRITE VALUE
1514  010344  022737  000010  001474            CMP     #10,$TEMP               ;TEST FOR FIRST NON-VALID
1515  010352  001351                            BNE     1$                      ;BRANCH IF STILL OK VALUES.
1516
1517                                    ;;*****************************************************************
1518                                    ;*TEST 36       STATIC BIT MAP P.C. INCREMENT
1519                                    ;;*****************************************************************
1520  010354  000004                    TST36:  SCOPE
1521  010356  012737  010376  001110            MOV     #1$,$LPERR
1522  010364  012737  000020  001124            MOV     #20,$GDDAT              ;LOAD EXPECTED READ VALUE
1523  010372  005077  171064                    CLR     @VGPC                   ;CLEAR MAP P.C.
1524  010376  012777  177777  171060  1$:      MOV     #-1,@VGBUF              ;LOAD A PIXEL
1525  010404  012700  000100                    MOV     #BIT6,R0                ;LOAD DELAY COUNT
1526  010410  105777  171044          3$:      TSTB    @VGCSR                  ;TEST IF MAP IS READY
1527  010414  100403                            BMI     4$                      ;BR IF YES
1528  010416  005300                            DEC     R0                      ;DELAY
1529  010420  001373                            BNE     3$                      ;BR IN NOT EXCEEDED
1530  010422  104014                            ERROR   14                      ;MAP READY FAILED TO SET
1531  010424  017737  171030  001126  4$:      MOV     @VGCSR,$BDDAT           ;READ RESULT VALUE FROM BITS 4-6 OF CSR
1532  010432  042737  177617  001126            BIC     #177617,$BDDAT          ;MASK TO UNUSED BITS
1533  010440  023737  001124  001126            CMP     $GDDAT,$BDDAT           ;TEST IF SAME
1534  010446  001401                            BEQ     2$              ;;BR IF SAME
1535  010450  104010                            ERROR   10                      ;BIT MAP P.C. FAILED TO INCREMENT
1536                                                                            ;BY LOADING BUFFER WITHOUT LOADING P.C.
1537  010452  062737  000020  001124  2$:      ADD     #BIT4,$GDDAT            ;UPDATE EXPECTED READ VALUE
1538  010460  022737  000200  001124            CMP     #BIT7,$GDDAT            ;TEST IF MORE BITS TO INCREMENT
1539  010466  001343                            BNE     1$              ;;BR IF MORE BITS
1540
```

```
1541                                    ;;*****************************************************************
1542                                    ;*TEST 37       READ-WRITE WORD TEST OF PIXEL 0,1,2 AND 3 -- BIT 0
1543                                    ;;*****************************************************************
1544  010470  000004                    TST37:  SCOPE
1545  010472  012737  010514  001110            MOV     #1$,$LPERR
1546  010500  012737  010000  001124            MOV     #BIT12,$GDDAT           ;LOAD EXPECTED READ VALUE
1547  010506  012737  000001  001474            MOV     #BIT0,$TEMP             ;LOAD EXPECTED WRITE VALUE
1548  010514  005077  170742            1$:     CLR     @VGPC                   ;RESET P.C.
1549  010520  005077  170740                    CLR     @VGBUF                  ;CLEAR DATA
1550  010524  005077  170732                    CLR     @VGPC                   ;RESET PC
1551  010530  105777  170724            3$:     TSTB    @VGCSR                  ;WAIT FOR MAP READY
1552  010534  100375                            BPL     3$
1553  010536  013777  001474  170720            MOV     $TEMP,@VGBUF            ;LOAD WRITE VLUE
1554  010544  105777  170710            4$:     TSTB    @VGCSR                  ;WAIT FOR READY
1555  010550  100375                            BPL     4$
1556  010552  017737  170702  001126            MOV     @VGCSR,$BDDAT           ;READ RESULT VALUE
1557  010560  042737  007777  001126            BIC     #7777,$BDDAT            ;MASK TO UNWANTED BITS
1558  010566  023737  001124  001126            CMP     $GDDAT,$BDDAT           ;TEST IF SAME
1559  010574  001401                            BEQ     2$                  ;;BR IF SAME
1560  010576  104011                            ERROR   11                      ;BIT0 OF A PIXEL FAILED TO SET
1561  010600  006337  001474            2$:     ASL     $TEMP                   ;ADJUST
1562  010604  006337  001474                    ASL     $TEMP                   ;  THE
1563  010610  006337  001474                    ASL     $TEMP                   ;    WRITE
1564  010614  006337  001474                    ASL     $TEMP                   ;      VALUE TO THE NEXT PIXEL
1565  010620  006337  001124                    ASL     $GDDAT                  ;ADJUST THE EXPECTED READ VALUE
1566  010624  001333                            BNE     1$                      ;BR IF; MORE BITS TO TEST
1567
```

```
                                        ;;*********************************************************************
                                        ;*TEST 40        BASIC LOOK UP TABLE (L.U.T.) TEST
                                        ;;*********************************************************************
010626  000004                  TST40:  SCOPE
010630  005737  001544                  TST     BURN                    ;TEST IF IN "BURN-IN" MODE
010634  001406                          BEQ     2$                      ;BR IF NOT
010636  013777  001546  170704          MOV     COAXSW,@COAX            ;CHANGE THE RELAY
010644  004537  016666                  JSR     R5,DELAY                ;WAIT FOR RELAY TO SETTLE
010650  000012                          10.
010652                          2$:
010652  005737  001200                  TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
010656  001422                          BEQ     TST41           ;;BR IF FIRST PASS
010660  032777  001000  170252          BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
010666  001016                          BNE     TST41           ;;BR IF INHIBIT IS SET
010670                          1$:
010670  004737  017306                  JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
010674  004737  016234                  JSR     PC,CLRMAP               ;CLEAR THE BIT MAP
010700  004537  017062                  JSR     R5,LODSTA               ;LOAD THE SEQUENCE TABLE
010704  000000                          0                               ;LOC 0 WITH 14 - LOC 1-17 WITH 63
010706  016506                          TABLE3
010710  012777  002400  170542          MOV     #BIT10!BIT8,@VGCSR      ;ENABLE THE MAP
010716  004537  016666                  JSR     R5,DELAY
010722  000144                          100.
                                        ;;*********************************************************************
                                        ;*TEST 41        STATIC INTENSITY LEVEL TEST (L.U.T. 0)
                                        ;;*********************************************************************
010724  000004                  TST41:  SCOPE
010726  005737  001200                  TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
010732  001427                          BEQ     TST42           ;;BR IF FIRST PASS
010734  032777  001000  170176          BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
010742  001023                          BNE     TST42           ;;BR IF INHIBIT IS SET
010744  004737  017306                  JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
010750  004737  016234                  JSR     PC,CLRMAP               ;ENSURE CLEAR MAP
010754  012777  002400  170476          MOV     #BIT10!BIT8,@VGCSR      ;ENABLE 'MONO' AND 'MAP'
010762  012737  000017  001474          MOV     #17,$TEMP
010770  013777  001474  170470  1$:     MOV     $TEMP,@VGCOLR           ;LOAD LOC. 0 WITH A INTENSITY LEVEL
010776  004537  016666                  JSR     R5,DELAY
011002  000012                          10.
011004  005337  001474                  DEC     $TEMP                   ;REDUCE THE INTENSITY LEVEL
011010  001367                          BNE     1$              ;;BR IF MORE LEVELS TO TEST
```

```
                                ;;*****************************************************************
                                ;*TEST 42       DYNAMIC WORD TESTING OF PIXEL 0  (FIRST MAP LOCATION)
                                ;;*****************************************************************
011012  000004                  TST42:  SCOPE
011014  005737  001200                  TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
011020  001432                          BEQ     TST43           ;;BR IF FIRST PASS
011022  032777  001000  170110          BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
011030  001026                          BNE     TST43           ;;BR IF INHIBIT IS SET
011032  004737  017306                  JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #

011036  004737  016234                  JSR     PC,CLRMAP               ;CLEAR THE MAP
011042  012777  002000  170410          MOV     #BIT10,@VGCSR           ;SET 'MONO'

011050  004537  017062                  JSR     R5,LODSTA               ;LOAD 4 INTO L.U.T. 0 AND
011054  000000                          0                               ; LOAD #17 INTO L.U.T. 1
011056  016526                          TABLE4
011060  005077  170376                  CLR     @VGPC                   ;CLEAR MAP P.C.
011064  012777  000001  170372          MOV     #1,@VGBUF               ;LOAD PIXEL0 BIT0
011072  052777  000400  170360          BIS     #BIT8,@VGCSR            ;ENABLE THE MAP
011100  004537  016666                  JSR     R5,DELAY
011104  000144                          100.

                                ;;*****************************************************************
                                ;*TEST 43       DYNAMIC WORD TESTING OF PIXEL 1  (FIRST MAP LOCATION)
                                ;;*****************************************************************
011106  000004                  TST43:  SCOPE
011110  005737  001200                  TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
011114  001432                          BEQ     TST44           ;;BR IF FIRST PASS
011116  032777  001000  170014          BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
011124  001026                          BNE     TST44           ;;BR IF INHIBIT IS SET
011126  004737  017306                  JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #

011132  004737  016234                  JSR     PC,CLRMAP               ;CLEAR THE MAP
011136  012777  002000  170314          MOV     #BIT10,@VGCSR           ;SET 'MONO'

011144  004537  017062                  JSR     R5,LODSTA               ;LOAD 4 INTO L.U.T. 0 AND
011150  000000                          0                               ; LOAD #17 INTO L.U.T. 1
011152  016526                          TABLE4
011154  005077  170302                  CLR     @VGPC                   ;CLEAR MAP P.C.
011160  012777  000020  170276          MOV     #20,@VGBUF              ;LOAD PIXEL0 BIT0
011166  052777  000400  170264          BIS     #BIT8,@VGCSR            ;ENABLE THE MAP
011174  004537  016666                  JSR     R5,DELAY
011200  000144                          100.
```

```
1662                                    ;;*****************************************************************
1663                                    ;*TEST 44       DYNAMIC WORD TESTING OF PIXEL 2  (FIRST MAP LOCATION)
1664                                    ;;*****************************************************************
1665  011202  000004                   TST44:  SCOPE
1666  011204  005737  001200                   TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
1667  011210  001432                           BEQ     TST45           ;;BR IF FIRST PASS
1668  011212  032777  001000  167720           BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
1669  011220  001026                           BNE     TST45           ;;BR IF INHIBIT IS SET
1670  011222  004737  017306                   JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
1671
1672  011226  004737  016234                   JSR     PC,CLRMAP               ;CLEAR THE MAP
1673  011232  012777  002000  170220           MOV     #BIT10,@VGCSR           ;SET 'MONO'
1674
1675  011240  004537  017062                   JSR     R5,LODSTA               ;LOAD 4 INTO L.U.T. 0 AND
1676  011244  000000                           0                               ; LOAD #17 INTO L.U.T. 1
1677  011246  016526                           TABLE4
1678  011250  005077  170206                   CLR     @VGPC                   ;CLEAR MAP P.C.
1679  011254  012777  000400  170202           MOV     #400,@VGBUF             ;LOAD PIXEL2 BIT0
1680  011262  052777  000400  170170           BIS     #BIT8,@VGCSR            ;ENABLE THE MAP
1681  011270  004537  016666                   JSR     R5,DELAY
1682  011274  000144                           100.
1683
1684                                    ;;*****************************************************************
1685                                    ;*TEST 45       DYNAMIC WORD TESTING OF PIXEL 3  (FIRST MAP LOCATION)
1686                                    ;;*****************************************************************
1687  011276  000004                   TST45:  SCOPE
1688  011300  005737  001200                   TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
1689  011304  001432                           BEQ     TST46           ;;BR IF FIRST PASS
1690  011306  032777  001000  167624           BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
1691  011314  001026                           BNE     TST46           ;;BR IF INHIBIT IS SET
1692  011316  004737  017306                   JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
1693
1694  011322  004737  016234                   JSR     PC,CLRMAP               ;CLEAR THE MAP
1695  011326  012777  002000  170124           MOV     #BIT10,@VGCSR           ;SET 'MONO'
1696
1697  011334  004537  017062                   JSR     R5,LODSTA               ;LOAD 4 INTO L.U.T. 0 AND
1698  011340  000000                           0                               ; LOAD #17 INTO L.U.T. 1
1699  011342  016526                           TABLE4
1700  011344  005077  170112                   CLR     @VGPC                   ;CLEAR MAP P.C.
1701  011350  012777  010000  170106           MOV     #10000,@VGBUF           ;LOAD PIXEL3 BIT0
1702  011356  052777  000400  170074           BIS     #BIT8,@VGCSR            ;ENABLE THE MAP
1703  011364  004537  016666                   JSR     R5,DELAY
1704  011370  000144                           100.
1705
```

```
                        ;;*****************************************************************
                        ;*TEST 46       DYNAMIC WORD TESTING OF 'PIXEL0' (INCREMENT MAP P.C.) TEST L.U.T. 1
                        ;;*****************************************************************
011372  000004         TST46:  SCOPE
011374  005737  001200          TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
011400  001441          BEQ     TST47           ;;BR IF FIRST PASS
011402  032777  001000  167530  BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
011410  001035          BNE     TST47           ;;BR IF INHIBIT IS SET
011412  004737  017306          JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
011416  004737  016234          JSR     PC,CLRMAP
011422  004537  017062          JSR     R5,LODSTA               ;LOAD COLOR TABLE
011426  000000          0                               ;LOC 0 AND 2 THRU 17 WITH 0
011430  016466          TABLE2                          ;LOC 1 WITH A 17
                        
011432  005077  170024          CLR     @VGPC                   ;LOAD MAP P.C. TO 0
011436  013700  001464          MOV     VGBUF,R0                ;LOAD PIXEL ADDRESS
011442  013701  001542          MOV     NUMPIX,R1               ;LOAD # OF PIXELS
011446  105777  170006  1$:     TSTB    @VGCSR                  ;WAIT FOR MAP READY
011452  100375          BPL     1$
011454  012710  000001          MOV     #1,(R0)                 ;LOAD BIT0 OF PIXEL0
011460  005301          DEC     R1                      ;FINISHED ALL PIXEL0'S
011462  001371          BNE     1$                      ;BR IF NOT
011464  012777  002400  167766  MOV     #BIT10!BIT8,@VGCSR      ;ENABLE THE MAP
011472  004737  017554          JSR     PC,LDLIN                ;LOAD REFERENCE LINE
011476  004537  016666          JSR     R5,DELAY
011502  000144          100.
                        
                        ;;*****************************************************************
                        ;*TEST 47       DYNAMIC WORD TESTING OF 'PIXEL1' (INCREMENT MAP P.C.) TEST L.U.T. 1
                        ;;*****************************************************************
011504  000004         TST47:  SCOPE
011506  005737  001200          TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
011512  001441          BEQ     TST50           ;;BR IF FIRST PASS
011514  032777  001000  167416  BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
011522  001035          BNE     TST50           ;;BR IF INHIBIT IS SET
011524  004737  017306          JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
011530  004737  016234          JSR     PC,CLRMAP
011534  004537  017062          JSR     R5,LODSTA               ;LOAD COLOR TABLE
011540  000000          0                               ;LOC 0 AND 2 THRU 17 WITH 0
011542  016466          TABLE2                          ;LOC 1 WITH A 17
                        
011544  005077  167712          CLR     @VGPC                   ;LOAD MAP P.C. TO 0
011550  013700  001464          MOV     VGBUF,R0                ;LOAD PIXEL ADDRESS
011554  013701  001542          MOV     NUMPIX,R1               ;LOAD # OF PIXELS
011560  105777  167674  1$:     TSTB    @VGCSR                  ;WAIT FOR MAP READY
011564  100375          BPL     1$
011566  012710  000020          MOV     #20,(R0)                ;LOAD BIT0 OF PIXEL1
011572  005301          DEC     R1                      ;FINISHED ALL PIXEL1'S
011574  001371          BNE     1$                      ;BR IF NOT
011576  012777  002400  167654  MOV     #BIT10!BIT8,@VGCSR      ;ENABLE THE MAP
011604  004737  017554          JSR     PC,LDLIN                ;LOAD REFERENCE LINE
011610  004537  016666          JSR     R5,DELAY
011614  000144          100.
```

```
                                ;;*****************************************************************
                                ;*TEST 50       DYNAMIC WORD TESTING OF 'PIXEL2' (INCREMENT MAP P.C.) TEST L.U.T. 1
                                ;;*****************************************************************
011616  000004                TST50:  SCOPE
011620  005737  001200                TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
011624  001441                        BEQ     TST51           ;;BR IF FIRST PASS
011626  032777  001000  167304        BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
011634  001035                        BNE     TST51           ;;BR IF INHIBIT IS SET
011636  004737  017306                JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
011642  004737  016234                JSR     PC,CLRMAP
011646  004537  017062                JSR     R5,LODSTA               ;LOAD COLOR TABLE
011652  000000                        0                               ;LOC 0 AND 2 THRU 17 WITH 0
011654  016466                        TABLE2                          ;LOC 1 WITH A 17

011656  005077  167600                CLR     @VGPC                   ;LOAD MAP P.C. TO 0
011662  013700  001464                MOV     VGBUF,R0                ;LOAD PIXEL ADDRESS
011666  013701  001542                MOV     NUMPIX,R1               ;LOAD # OF PIXELS
011672  105777  167562        1$:     TSTB    @VGCSR                  ;WAIT FOR MAP READY
011676  100375                        BPL     1$
011700  012710  000400                MOV     #400,(R0)               ;LOAD BIT0 OF PIXEL2
011704  005301                        DEC     R1                      ;FINISHED ALL PIXEL2'S
011706  001371                        BNE     1$                      ;BR IF NOT
011710  012777  002400  167542        MOV     #BIT10!BIT8,@VGCSR      ;ENABLE THE MAP
011716  004737  017554                JSR     PC,LDLIN                ;LOAD REFERENCE LINE
011722  004537  016666                JSR     R5,DELAY
011726  000144                        100.

                                ;;*****************************************************************
                                ;*TEST 51       DYNAMIC WORD TESTING OF 'PIXEL3' (INCREMENT MAP P.C.) TEST L.U.T. 1
                                ;;*****************************************************************
011730  000004                TST51:  SCOPE
011732  005737  001200                TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
011736  001441                        BEQ     TST52           ;;BR IF FIRST PASS
011740  032777  001000  167172        BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
011746  001035                        BNE     TST52           ;;BR IF INHIBIT IS SET
011750  004737  017306                JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
011754  004737  016234                JSR     PC,CLRMAP
011760  004537  017062                JSR     R5,LODSTA               ;LOAD COLOR TABLE
011764  000000                        0                               ;LOC 0 AND 2 THRU 17 WITH 0
011766  016466                        TABLE2                          ;LOC 1 WITH A 17

011770  005077  167466                CLR     @VGPC                   ;LOAD MAP P.C. TO 0
011774  013700  001464                MOV     VGBUF,R0                ;LOAD PIXEL ADDRESS
012000  013701  001542                MOV     NUMPIX,R1               ;LOAD # OF PIXELS
012004  105777  167450        1$:     TSTB    @VGCSR                  ;WAIT FOR MAP READY
012010  100375                        BPL     1$
012012  012710  010000                MOV     #10000,(R0)             ;LOAD BIT0 OF PIXEL3
012016  005301                        DEC     R1                      ;FINISHED ALL PIXEL3'S
012020  001371                        BNE     1$                      ;BR IF NOT
012022  012777  002400  167430        MOV     #BIT10!BIT8,@VGCSR      ;ENABLE THE MAP
012030  004737  017554                JSR     PC,LDLIN                ;LOAD REFERENCE LINE
012034  004537  016666                JSR     R5,DELAY
012040  000144                        100.
```

```
                                ;;*****************************************************************
                                ;*TEST 52       DYNAMIC WORD TESTING OF 'PIXEL0' (INCREMENT MAP P.C.) TEST L.U.T. 2
                                ;;*****************************************************************
012042  000004                TST52:  SCOPE
012044  005737  001200                TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
012050  001441                        BEQ     TST53           ;;BR IF FIRST PASS
012052  032777  001000  167060        BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
012060  001035                        BNE     TST53           ;;BR IF INHIBIT IS SET
012062  004737  017306                JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
012066  004737  016234                JSR     PC,CLRMAP
012072  004537  017062                JSR     R5,LODSTA               ;LOAD COLOR TABLE
012076  000000                        0                               ;LOC 0,1 AND 3 THRU 17 WITH 0
012100  016606                        TABLE6                          ;LOC 2 WITH A 17
                                
012102  005077  167354                CLR     @VGPC                   ;LOAD MAP P.C. TO 0
012106  013700  001464                MOV     VGBUF,R0                ;LOAD PIXEL ADDRESS
012112  013701  001542                MOV     NUMPIX,R1               ;LOAD # OF PIXELS
012116  105777  167336        1$:     TSTB    @VGCSR                  ;WAIT FOR MAP READY
012122  100375                        BPL     1$
012124  012710  000002                MOV     #2,(R0)                 ;LOAD BIT1 OF PIXEL0
012130  005301                        DEC     R1                      ;FINISHED ALL PIXEL0'S
012132  001371                        BNE     1$                      ;BR IF NOT
012134  012777  002400  167316        MOV     #BIT10!BIT8,@VGCSR      ;ENABLE THE MAP
012142  004737  017554                JSR     PC,LDLIN                ;LOAD REFERENCE LINE
012146  004537  016666                JSR     R5,DELAY
012152  000144                        100.
                                
                                ;;*****************************************************************
                                ;*TEST 53       DYNAMIC WORD TESTING OF 'PIXEL1' (INCREMENT MAP P.C.) TEST L.U.T. 2
                                ;;*****************************************************************
012154  000004                TST53:  SCOPE
012156  005737  001200                TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
012162  001441                        BEQ     TST54           ;;BR IF FIRST PASS
012164  032777  001000  166746        BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
012172  001035                        BNE     TST54           ;;BR IF INHIBIT IS SET
012174  004737  017306                JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
012200  004737  016234                JSR     PC,CLRMAP
012204  004537  017062                JSR     R5,LODSTA               ;LOAD COLOR TABLE
012210  000000                        0                               ;LOC 0,1 AND 3 THRU 17 WITH 0
012212  016606                        TABLE6                          ;LOC 2 WITH A 17
                                
012214  005077  167242                CLR     @VGPC                   ;LOAD MAP P.C. TO 0
012220  013700  001464                MOV     VGBUF,R0                ;LOAD PIXEL ADDRESS
012224  013701  001542                MOV     NUMPIX,R1               ;LOAD # OF PIXELS
012230  105777  167224        1$:     TSTB    @VGCSR                  ;WAIT FOR MAP READY
012234  100375                        BPL     1$
012236  012710  000040                MOV     #40,(R0)                ;LOAD BIT1 OF PIXEL1
012242  005301                        DEC     R1                      ;FINISHED ALL PIXEL1'S
012244  001371                        BNE     1$                      ;BR IF NOT
012246  012777  002400  167204        MOV     #BIT10!BIT8,@VGCSR      ;ENABLE THE MAP
012254  004737  017554                JSR     PC,LDLIN                ;LOAD REFERENCE LINE
012260  004537  016666                JSR     R5,DELAY
012264  000144                        100.
```

```
                                ;;*****************************************************************
                                ;*TEST 54       DYNAMIC WORD TESTING OF 'PIXEL2' (INCREMENT MAP P.C.) TEST L.U.T. 2
                                ;;*****************************************************************
012266  000004                TST54:  SCOPE
012270  005737  001200                TST     $PASS                           ;TEST IF FIRST PASS OF PROGRAM
012274  001441                        BEQ     TST55           ;;BR IF FIRST PASS
012276  032777  001000  166634        BIT     #SW09,@SWR                      ;TEST IF INHIBIT VISUAL MAP PATTERNS
012304  001035                        BNE     TST55           ;;BR IF INHIBIT IS SET
012306  004737  017306                JSR     PC,TESTID                       ;DISPLAY MAP # AND TEST #
012312  004737  016234                JSR     PC,CLRMAP
012316  004537  017062                JSR     R5,LODSTA                       ;LOAD COLOR TABLE
012322  000000                        0                                       ;LOC 0,1 AND 3 THRU 17 WITH 0
012324  016606                        TABLE6                                  ;LOC 2 WITH A 17

012326  005077  167130                CLR     @VGPC                           ;LOAD MAP P.C. TO 0
012332  013700  001464                MOV     VGBUF,R0                        ;LOAD PIXEL ADDRESS
012336  013701  001542                MOV     NUMPIX,R1                       ;LOAD # OF PIXELS
012342  105777  167112        1$:     TSTB    @VGCSR                          ;WAIT FOR MAP READY
012346  100375                        BPL     1$
012350  012710  001000                MOV     #1000,(R0)                      ;LOAD BIT1 OF PIXEL2
012354  005301                        DEC     R1                              ;FINISHED ALL PIXEL2'S
012356  001371                        BNE     1$                              ;BR IF NOT
012360  012777  002400  167072        MOV     #BIT10!BIT8,@VGCSR              ;ENABLE THE MAP
012366  004737  017554                JSR     PC,LDLIN                        ;LOAD REFERENCE LINE
012372  004537  016666                JSR     R5,DELAY
012376  000144                        100.

                                ;;*****************************************************************
                                ;*TEST 55       DYNAMIC WORD TESTING OF 'PIXEL3' (INCREMENT MAP P.C.) TEST L.U.T. 2
                                ;;*****************************************************************
012400  000004                TST55:  SCOPE
012402  005737  001200                TST     $PASS                           ;TEST IF FIRST PASS OF PROGRAM
012406  001441                        BEQ     TST56           ;;BR IF FIRST PASS
012410  032777  001000  166522        BIT     #SW09,@SWR                      ;TEST IF INHIBIT VISUAL MAP PATTERNS
012416  001035                        BNE     TST56           ;;BR IF INHIBIT IS SET
012420  004737  017306                JSR     PC,TESTID                       ;DISPLAY MAP # AND TEST #
012424  004737  016234                JSR     PC,CLRMAP
012430  004537  017062                JSR     R5,LODSTA                       ;LOAD COLOR TABLE
012434  000000                        0                                       ;LOC 0,1 AND 3 THRU 17 WITH 0
012436  016606                        TABLE6                                  ;LOC 2 WITH A 17

012440  005077  167016                CLR     @VGPC                           ;LOAD MAP P.C. TO 0
012444  013700  001464                MOV     VGBUF,R0                        ;LOAD PIXEL ADDRESS
012450  013701  001542                MOV     NUMPIX,R1                       ;LOAD # OF PIXELS
012454  105777  167000        1$:     TSTB    @VGCSR                          ;WAIT FOR MAP READY
012460  100375                        BPL     1$
012462  012710  020000                MOV     #20000,(R0)                     ;LOAD BIT1 OF PIXEL3
012466  005301                        DEC     R1                              ;FINISHED ALL PIXEL3'S
012470  001371                        BNE     1$                              ;BR IF NOT
012472  012777  002400  166760        MOV     #BIT10!BIT8,@VGCSR              ;ENABLE THE MAP
012500  004737  017554                JSR     PC,LDLIN                        ;LOAD REFERENCE LINE
012504  004537  016666                JSR     R5,DELAY
012510  000144                        100.
```

```
1920                                    ;;*****************************************************************
1921                                    ;*TEST 56       DYNAMIC WORD TESTING OF 'PIXEL0' (INCREMENT MAP P.C.) TEST L.U.T. 4
1922                                    ;;*****************************************************************
1923  012512  000004                    TST56:  SCOPE
1924  012514  005737  001200                    TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
1925  012520  001441                            BEQ     TST57           ;;BR IF FIRST PASS
1926  012522  032777  001000  166410            BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
1927  012530  001035                            BNE     TST57           ;;BR IF INHIBIT IS SET
1928  012532  004737  017306                    JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
1929  012536  004737  016234                    JSR     PC,CLRMAP
1930  012542  004537  017062                    JSR     R5,LODSTA               ;LOAD COLOR TABLE
1931  012546  000000                            0                               ;LOC 0,1,2,3 AND 5 THRU 17 WITH 0
1932  012550  016626                            TABLE7                          ;LOC 4 WITH A 17
1933
1934  012552  005077  166704                    CLR     @VGPC                   ;LOAD MAP P.C. TO 0
1935  012556  013700  001464                    MOV     VGBUF,R0                ;LOAD PIXEL ADDRESS
1936  012562  013701  001542                    MOV     NUMPIX,R1               ;LOAD # OF PIXELS
1937  012566  105777  166666            1$:     TSTB    @VGCSR                  ;WAIT FOR MAP READY
1938  012572  100375                            BPL     1$
1939  012574  012710  000004                    MOV     #4,(R0)                 ;LOAD BIT2 OF PIXEL0
1940  012600  005301                            DEC     R1                      ;FINISHED ALL PIXEL0'S
1941  012602  001371                            BNE     1$                      ;BR IF NOT
1942  012604  012777  002400  166646            MOV     #BIT10!BIT8,@VGCSR      ;ENABLE THE MAP
1943  012612  004737  017554                    JSR     PC,LDLIN                ;LOAD REFERENCE LINE
1944  012616  004537  016666                    JSR     R5,DELAY
1945  012622  000144                            100.
1946
1947                                    ;;*****************************************************************
1948                                    ;*TEST 57       DYNAMIC WORD TESTING OF 'PIXEL1' (INCREMENT MAP P.C.) TEST L.U.T. 4
1949                                    ;;*****************************************************************
1950  012624  000004                    TST57:  SCOPE
1951  012626  005737  001200                    TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
1952  012632  001441                            BEQ     TST60           ;;BR IF FIRST PASS
1953  012634  032777  001000  166276            BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
1954  012642  001035                            BNE     TST60           ;;BR IF INHIBIT IS SET
1955  012644  004737  017306                    JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
1956  012650  004737  016234                    JSR     PC,CLRMAP
1957  012654  004537  017062                    JSR     R5,LODSTA               ;LOAD COLOR TABLE
1958  012660  000000                            0                               ;LOC 0,1,2,3 AND 5 THRU 17 WITH 0
1959  012662  016626                            TABLE7                          ;LOC 4 WITH A 17
1960
1961  012664  005077  166572                    CLR     @VGPC                   ;LOAD MAP P.C. TO 0
1962  012670  013700  001464                    MOV     VGBUF,R0                ;LOAD PIXEL ADDRESS
1963  012674  013701  001542                    MOV     NUMPIX,R1               ;LOAD # OF PIXELS
1964  012700  105777  166554            1$:     TSTB    @VGCSR                  ;WAIT FOR MAP READY
1965  012704  100375                            BPL     1$
1966  012706  012710  000100                    MOV     #100,(R0)               ;LOAD BIT2 OF PIXEL1
1967  012712  005301                            DEC     R1                      ;FINISHED ALL PIXEL1'S
1968  012714  001371                            BNE     1$                      ;BR IF NOT
1969  012716  012777  002400  166534            MOV     #BIT10!BIT8,@VGCSR      ;ENABLE THE MAP
1970  012724  004737  017554                    JSR     PC,LDLIN                ;LOAD REFERENCE LINE
1971  012730  004537  016666                    JSR     R5,DELAY
1972  012734  000144                            100.
1973
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                                ;;*****************************************************************
                                ;*TEST 60       DYNAMIC WORD TESTING OF 'PIXEL2' (INCREMENT MAP P.C.) TEST L.U.T. 4
                                ;;*****************************************************************
012736  000004                TST60:  SCOPE
012740  005737  001200                  TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
012744  001441                          BEQ     TST61           ;;BR IF FIRST PASS
012746  032777  001000  166164          BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
012754  001035                          BNE     TST61           ;;BR IF INHIBIT IS SET
012756  004737  017306                  JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
012762  004737  016234                  JSR     PC,CLRMAP
012766  004537  017062                  JSR     R5,LODSTA               ;LOAD COLOR TABLE
012772  000000                          0                               ;LOC 0,1,2,3 AND 5 THRU 17 WITH 0
012774  016626                          TABLE7                          ;LOC 41 WITH A 17
                                
012776  005077  166460                  CLR     @VGPC                   ;LOAD MAP P.C. TO 0
013002  013700  001464                  MOV     VGBUF,R0                ;LOAD PIXEL ADDRESS
013006  013701  001542                  MOV     NUMPIX,R1               ;LOAD # OF PIXELS
013012  105777  166442          1$:     TSTB    @VGCSR                  ;WAIT FOR MAP READY
013016  100375                          BPL     1$
013020  012710  002000                  MOV     #2000,(R0)              ;LOAD BIT2 OF PIXEL2
013024  005301                          DEC     R1                      ;FINISHED ALL PIXEL2'S
013026  001371                          BNE     1$                      ;BR IF NOT
013030  012777  002400  166422          MOV     #BIT10!BIT8,@VGCSR      ;ENABLE THE MAP
013036  004737  017554                  JSR     PC,LDLIN                ;LOAD REFERENCE LINE
013042  004537  016666                  JSR     R5,DELAY
013046  000144                          100.
                                
                                ;;*****************************************************************
                                ;*TEST 61       DYNAMIC WORD TESTING OF 'PIXEL3' (INCREMENT MAP P.C.) TEST L.U.T. 4
                                ;;*****************************************************************
013050  000004                TST61:  SCOPE
013052  005737  001200                  TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
013056  001441                          BEQ     TST62           ;;BR IF FIRST PASS
013060  032777  001000  166052          BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
013066  001035                          BNE     TST62           ;;BR IF INHIBIT IS SET
013070  004737  017306                  JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
013074  004737  016234                  JSR     PC,CLRMAP
013100  004537  017062                  JSR     R5,LODSTA               ;LOAD COLOR TABLE
013104  000000                          0                               ;LOC 0,1,2,3 AND 5 THRU 17 WITH 0
013106  016626                          TABLE7                          ;LOC 4 WITH A 17
                                
013110  005077  166346                  CLR     @VGPC                   ;LOAD MAP P.C. TO 0
013114  013700  001464                  MOV     VGBUF,R0                ;LOAD PIXEL ADDRESS
013120  013701  001542                  MOV     NUMPIX,R1               ;LOAD # OF PIXELS
013124  105777  166330          1$:     TSTB    @VGCSR                  ;WAIT FOR MAP READY
013130  100375                          BPL     1$
013132  012710  040000                  MOV     #40000,(R0)             ;LOAD BIT2 OF PIXEL3
013136  005301                          DEC     R1                      ;FINISHED ALL PIXEL3'S
013140  001371                          BNE     1$                      ;BR IF NOT
013142  012777  002400  166310          MOV     #BIT10!BIT8,@VGCSR      ;ENABLE THE MAP
013150  004737  017554                  JSR     PC,LDLIN                ;LOAD REFERENCE LINE
013154  004537  016666                  JSR     R5,DELAY
013160  000144                          100.
```

```
                        ;;*****************************************************************
                        ;*TEST 62       DYNAMIC WORD TESTING OF 'PIXEL0' (INCREMENT MAP P.C.) TEST L.U.T. 10
                        ;;*****************************************************************
013162  000004          TST62:  SCOPE
013164  005737  001200          TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
013170  001441          BEQ     TST63           ;;BR IF FIRST PASS
013172  032777  001000  165740  BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
013200  001035          BNE     TST63           ;;BR IF INHIBIT IS SET
013202  004737  017306          JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
013206  004737  016234          JSR     PC,CLRMAP
013212  004537  017062          JSR     R5,LODSTA               ;LOAD COLOR TABLE
013216  000000                  0                               ;LOC 0,1,2,3,4,5,6,7 AND 11 THRU 17 WITH 0
013220  016646                  TABLE8                          ;LOC 10 WITH A 17
                        
013222  005077  166234          CLR     @VGPC                   ;LOAD MAP P.C. TO 0
013226  013700  001464          MOV     VGBUF,R0                ;LOAD PIXEL ADDRESS
013232  013701  001542          MOV     NUMPIX,R1               ;LOAD # OF PIXELS
013236  105777  166216  1$:     TSTB    @VGCSR                  ;WAIT FOR MAP READY
013242  100375                  BPL     1$
013244  012710  000010          MOV     #10,(R0)                ;LOAD BIT3 OF PIXEL0
013250  005301                  DEC     R1                      ;FINISHED ALL PIXEL0'S
013252  001371                  BNE     1$                      ;BR IF NOT
013254  012777  002400  166176  MOV     #BIT10!BIT8,@VGCSR      ;ENABLE THE MAP
013262  004737  017554          JSR     PC,LDLIN                ;LOAD REFERENCE LINE
013266  004537  016666          JSR     R5,DELAY
013272  000144                  100.
                        
                        ;;*****************************************************************
                        ;*TEST 63       DYNAMIC WORD TESTING OF 'PIXEL1' (INCREMENT MAP P.C.) TEST L.U.T. 10
                        ;;*****************************************************************
013274  000004          TST63:  SCOPE
013276  005737  001200          TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
013302  001441          BEQ     TST64           ;;BR IF FIRST PASS
013304  032777  001000  165626  BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
013312  001035          BNE     TST64           ;;BR IF INHIBIT IS SET
013314  004737  017306          JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
013320  004737  016234          JSR     PC,CLRMAP
013324  004537  017062          JSR     R5,LODSTA               ;LOAD COLOR TABLE
013330  000000                  0                               ;LOC 0,1,2,3,4,5,6,7 AND 11 THRU 17 WITH 0
013332  016646                  TABLE8                          ;LOC 10 WITH A 17
                        
013334  005077  166122          CLR     @VGPC                   ;LOAD MAP P.C. TO 0
013340  013700  001464          MOV     VGBUF,R0                ;LOAD PIXEL ADDRESS
013344  013701  001542          MOV     NUMPIX,R1               ;LOAD # OF PIXELS
013350  105777  166104  1$:     TSTB    @VGCSR                  ;WAIT FOR MAP READY
013354  100375                  BPL     1$
013356  012710  000200          MOV     #200,(R0)               ;LOAD BIT3 OF PIXEL1
013362  005301                  DEC     R1                      ;FINISHED ALL PIXEL1'S
013364  001371                  BNE     1$                      ;BR IF NOT
013366  012777  002400  166064  MOV     #BIT10!BIT8,@VGCSR      ;ENABLE THE MAP
013374  004737  017554          JSR     PC,LDLIN                ;LOAD REFERENCE LINE
013400  004537  016666          JSR     R5,DELAY
013404  000144                  100.
```

```
                                ;;*****************************************************************
                                ;*TEST 64       DYNAMIC WORD TESTING OF 'PIXEL2' (INCREMENT MAP P.C.) TEST L.U.T. 10
                                ;;*****************************************************************
013406  000004                TST64:  SCOPE
013410  005737  001200                TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
013414  001441                        BEQ     TST65           ;;BR IF FIRST PASS
013416  032777  001000  165514        BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
013424  001035                        BNE     TST65           ;;BR IF INHIBIT IS SET
013426  004737  017306                JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
013432  004737  016234                JSR     PC,CLRMAP
013436  004537  017062                JSR     R5,LODSTA               ;LOAD COLOR TABLE
013442  000000                        0                               ;LOC 0,1,2,3,4,5,6,7 AND 11 THRU 17 WITH 0
013444  016646                        TABLE8                          ;LOC 10 WITH A 17
                                
013446  005077  166010                CLR     @VGPC                   ;LOAD MAP P.C. TO 0
013452  013700  001464                MOV     VGBUF,R0                ;LOAD PIXEL ADDRESS
013456  013701  001542                MOV     NUMPIX,R1               ;LOAD # OF PIXELS
013462  105777  165772        1$:     TSTB    @VGCSR                  ;WAIT FOR MAP READY
013466  100375                        BPL     1$
013470  012710  004000                MOV     #4000,(R0)              ;LOAD BIT3 OF PIXEL2
013474  005301                        DEC     R1                      ;FINISHED ALL PIXEL2'S
013476  001371                        BNE     1$                      ;BR IF NOT
013500  012777  002400  165752        MOV     #BIT10!BIT8,@VGCSR      ;ENABLE THE MAP
013506  004737  017554                JSR     PC,LDLIN                ;LOAD REFERENCE LINE
013512  004537  016666                JSR     R5,DELAY
013516  000144                        100.
                                
                                ;;*****************************************************************
                                ;*TEST 65       DYNAMIC WORD TESTING OF 'PIXEL3' (INCREMENT MAP P.C.) TEST L.U.T. 10
                                ;;*****************************************************************
013520  000004                TST65:  SCOPE
013522  005737  001200                TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
013526  001441                        BEQ     TST66           ;;BR IF FIRST PASS
013530  032777  001000  165402        BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
013536  001035                        BNE     TST66           ;;BR IF INHIBIT IS SET
013540  004737  017306                JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
013544  004737  016234                JSR     PC,CLRMAP
013550  004537  017062                JSR     R5,LODSTA               ;LOAD COLOR TABLE
013554  000000                        0                               ;LOC 0,1,2,3,4,5,6,7 AND 11 THRU 17 WITH 0
013556  016646                        TABLE8                          ;LOC 10 WITH A 17
                                
013560  005077  165676                CLR     @VGPC                   ;LOAD MAP P.C. TO 0
013564  013700  001464                MOV     VGBUF,R0                ;LOAD PIXEL ADDRESS
013570  013701  001542                MOV     NUMPIX,R1               ;LOAD # OF PIXELS
013574  105777  165660        1$:     TSTB    @VGCSR                  ;WAIT FOR MAP READY
013600  100375                        BPL     1$
013602  012710  100000                MOV     #100000,(R0)            ;LOAD BIT3 OF PIXEL3
013606  005301                        DEC     R1                      ;FINISHED ALL PIXEL3'S
013610  001371                        BNE     1$                      ;BR IF NOT
013612  012777  002400  165640        MOV     #BIT10!BIT8,@VGCSR      ;ENABLE THE MAP
013620  004737  017554                JSR     PC,LDLIN                ;LOAD REFERENCE LINE
013624  004537  016666                JSR     R5,DELAY
013630  000144                        100.
```

```
                        ;;*****************************************************************
                        ;*TEST 66       DYNAMIC BYTE TESTING OF 'PIXEL0'
                        ;;*****************************************************************
013632  000004          TST66:  SCOPE
013634  005737  001200          TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
013640  001441          BEQ     TST67           ;;BR IF FIRST PASS
013642  032777  001000  165270  BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
013650  001035          BNE     TST67           ;;BR IF INHIBIT IS SET
013652  004737  017306          JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
013656  004737  016234          JSR     PC,CLRMAP
013662  004537  017062          JSR     R5,LODSTA               ;LOAD COLOR TABLE
013666  000000          0                               ;LOC 0 AND 2 THRU 17 WITH 17
013670  016466          TABLE2                          ;LOC 1 WITH A 4
013672  005077  165564          CLR     @VGPC                   ;LOAD MAP P.C. TO 0
013676  013700  001464          MOV     VGBUF,R0                ;LOAD PIXEL ADDRESS
013702  013701  001542          MOV     NUMPIX,R1               ;LOAD # OF PIXELS
013706  105777  165546  1$:     TSTB    @VGCSR                  ;WAIT FOR MAP READY
013712  100375          BPL     1$
013714  112710  000001          MOVB    #1,(R0)                 ;LOAD BIT0 OF PIXEL0
013720  005301          DEC     R1                      ;FINISHED ALL PIXEL 0'S
013722  001371          BNE     1$                      ;BR IF NOT
013724  012777  002400  165526  MOV     #BIT10!BIT8,@VGCSR      ;ENABLE THE MAP
013732  004737  017554          JSR     PC,LDLIN                ;LOAD REFERENCE LINE
013736  004537  016666          JSR     R5,DELAY
013742  000144          100.

                        ;;*****************************************************************
                        ;*TEST 67       DYNAMIC BYTE TESTING OF 'PIXEL1'
                        ;;*****************************************************************
013744  000004          TST67:  SCOPE
013746  005737  001200          TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
013752  001442          BEQ     TST70           ;;BR IF FIRST PASS
013754  032777  001000  165156  BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
013762  001036          BNE     TST70           ;;BR IF INHIBIT IS SET
013764  004737  017306          JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
013770  004737  016234          JSR     PC,CLRMAP
013774  004537  017062          JSR     R5,LODSTA               ;LOAD COLOR TABLE
014000  000000          0                               ;LOC 0 AND 2 THRU 17 WITH 17
014002  016466          TABLE2                          ;LOC 1 WITH A 4
014004  005077  165452          CLR     @VGPC                   ;LOAD MAP P.C. TO 0
014010  013700  001464          MOV     VGBUF,R0                ;LOAD PIXEL ADDRESS
014014  005200          INC     R0                      ;MAKE PIXEL 1 BYTE ADDRESS
014016  013701  001542          MOV     NUMPIX,R1               ;LOAD # OF PIXELS
014022  105777  165432  1$:     TSTB    @VGCSR                  ;WAIT FOR MAP READY
014026  100375          BPL     1$
014030  112710  000001          MOVB    #1,(R0)                 ;LOAD BIT0 OF PIXEL 1
014034  005301          DEC     R1                      ;FINISHED ALL PIXEL 1'S
014036  001371          BNE     1$                      ;BR IF NOT
014040  012777  002400  165412  MOV     #BIT10!BIT8,@VGCSR      ;ENABLE THE MAP
014046  004737  017554          JSR     PC,LDLIN                ;LOAD REFERENCE LINE
014052  004537  016666          JSR     R5,DELAY
014056  000144          100.
```

```
                                ;;*****************************************************************
                                ;*TEST 70        DYNAMIC BYTE TESTING OF 'PIXEL2'
                                ;;*****************************************************************
014060  000004                  TST70:  SCOPE
014062  005737  001200                  TST     $PASS                           ;TEST IF FIRST PASS OF PROGRAM
014066  001442                          BEQ     TST71           ;;BR IF FIRST PASS
014070  032777  001000  165042          BIT     #SW09,@SWR                      ;TEST IF INHIBIT VISUAL MAP PATTERNS
014076  001036                          BNE     TST71           ;;BR IF INHIBIT IS SET
014100  004737  017306                  JSR     PC,TESTID                       ;DISPLAY MAP # AND TEST #
014104  004737  016234                  JSR     PC,CLRMAP
014110  004537  017062                  JSR     R5,LODSTA                       ;LOAD COLOR TABLE
014114  000000                          0                                       ;LOC 0 AND 2 THRU 17 WITH 17
014116  016466                          TABLE2                                  ;LOC 1 WITH A 4
014120  005077  165336                  CLR     @VGPC                           ;LOAD MAP P.C. TO 0
014124  013700  001464                  MOV     VGBUF,R0                        ;LOAD PIXEL ADDRESS
014130  005720                          TST     (R0)+                           ;MAKE PIXEL 2 BYTE ADDRESS
014132  013701  001542                  MOV     NUMPIX,R1                       ;LOAD # OF PIXELS
014136  105777  165316          1$:     TSTB    @VGCSR                          ;WAIT FOR MAP READY
014142  100375                          BPL     1$
014144  112710  000001                  MOVB    #1,(R0)                         ;LOAD BIT0 OF PIXEL 2
014150  005301                          DEC     R1                              ;FINISHED ALL PIXEL 2'S
014152  001371                          BNE     1$                              ;BR IF NOT
014154  012777  002400  165276          MOV     #BIT10!BIT8,@VGCSR              ;ENABLE THE MAP
014162  004737  017554                  JSR     PC,LDLIN                        ;LOAD REFERENCE LINE
014166  004537  016666                  JSR     R5,DELAY
014172  000144                          100.

                                ;;*****************************************************************
                                ;*TEST 71        DYNAMIC BYTE TESTING OF 'PIXEL3'
                                ;;*****************************************************************
014174  000004                  TST71:  SCOPE
014176  005737  001200                  TST     $PASS                           ;TEST IF FIRST PASS OF PROGRAM
014202  001446                          BEQ     TST72           ;;BR IF FIRST PASS
014204  032777  001000  164726          BIT     #SW09,@SWR                      ;TEST IF INHIBIT VISUAL MAP PATTERNS
014212  001042                          BNE     TST72           ;;BR IF INHIBIT IS SET
014214  004737  017306                  JSR     PC,TESTID                       ;DISPLAY MAP # AND TEST #
014220  004737  016234                  JSR     PC,CLRMAP
014224  004537  017062                  JSR     R5,LODSTA                       ;LOAD COLOR TABLE
014230  000000                          0                                       ;LOC 0 AND 2 THRU 17 WITH 17
014232  016466                          TABLE2                                  ;LOC 1 WITH A 4
014234  005077  165222                  CLR     @VGPC                           ;LOAD MAP P.C. TO 0
014240  013700  001464                  MOV     VGBUF,R0                        ;LOAD PIXEL ADDRESS
014244  062700  000003                  ADD     #3,R0                           ;MAKE PIXEL 3 BYTE ADDRESS
014250  013701  001542                  MOV     NUMPIX,R1                       ;LOAD # OF PIXELS
014254  105777  165200          1$:     TSTB    @VGCSR                          ;WAIT FOR MAP READY
014260  100375                          BPL     1$
014262  112710  000001                  MOVB    #1,(R0)                         ;LOAD BIT0 OF PIXEL 3
014266  005301                          DEC     R1                              ;FINISHED ALL PIXEL 3'S
014270  001371                          BNE     1$                              ;BR IF NOT
014272  012777  002400  165160          MOV     #BIT10!BIT8,@VGCSR              ;ENABLE THE MAP
014300  004737  017554                  JSR     PC,LDLIN                        ;LOAD REFERENCE LINE
014304  004537  016666                  JSR     R5,DELAY
014310  000144                          100.
014312  042777  010000  165126          BIC     #BIT12,@VCCSR                   ;DISABLE REF. LINE
```

```
2240                                    ;;*****************************************************************
2241                                    ;*TEST 72       TEST THE 'EXPAND' FUNCTION
2242                                    ;;*****************************************************************
2243  014320  000004                    TST72:  SCOPE
2244  014322  005737  001200                    TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
2245  014326  001427                            BEQ     TST73           ;;BR IF FIRST PASS
2246  014330  032777  001000  164602            BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
2247  014336  001023                            BNE     TST73           ;;BR IF INHIBIT IS SET
2248  014340  004737  017306                    JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
2249  014344  004737  016234                    JSR     PC,CLRMAP
2250  014350  012777  000017  165110            MOV     #17,@VGCOLR             ;LOAD MAX INTENSITY INTO LOCATION 0
2251  014356  012777  002400  165074            MOV     #BIT10!BIT8,@VGCSR      ;SET "MONO" AND ENABLE BIT MAP
2252  014364  004537  016666                    JSR     R5,DELAY
2253  014370  000144                            100.
2254  014372  052777  004000  165060            BIS     #BIT11,@VGCSR           ;SET THE 'EXPAND' BIT
2255  014400  004537  016666                    JSR     R5,DELAY
2256  014404  000144                            100.
2257                                    ;;*****************************************************************
2258                                    ;*TEST 73       DRAW A BOX UP ON VSV01 SCREEN
2259                                    ;;*****************************************************************
2260  014406  000004                    TST73:  SCOPE
2261  014410  005737  001200                    TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
2262  014414  001476                            BEQ     TST74           ;;BR IF FIRST PASS
2263  014416  032777  001000  164514            BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
2264  014424  001072                            BNE     TST74           ;;BR IF INHIBIT IS SET
2265  014426  004737  017306                    JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
2266  014432  005000                            CLR     R0                      ;SET UP BIT MAP ADRS - TOP LINE
2267  014434  012701  073567                    MOV     #73567,R1               ;SET UP PIXEL DATA IN R1 - INT 7
2268  014440  004737  015770                    JSR     PC,DISPY                ;GO LOAD BIT MAP
2269  014444  005200                    1$:     INC     R0                      ;ADVANCE BIT MAP ADRS
2270  014446  022700  000040                    CMP     #40,R0                  ;TOP LINE DONE?
2271  014452  001403                            BEQ     2$                      ;BR IF SO
2272  014454  004737  016002                    JSR     PC,DCONT                ;LOAD NEXT PIXEL
2273  014460  000771                            BR      1$                      ;NEXT MAP LOAD
2274  014462  012700  007740            2$:     MOV     #7740,R0                ;SET UP BIT MAP ADRS - BOTTOM LINE
2275  014466  004737  015770                    JSR     PC,DISPY                ;GO LOAD BIT MAP
2276  014472  005200                    3$:     INC     R0                      ;ADVANCE ADRS
2277  014474  022700  010000                    CMP     #10000,R0               ;BOTTOM LINE DONE?
2278  014500  001403                            BEQ     4$                      ;BR IF SO
2279  014502  004737  016002                    JSR     PC,DCONT                ;LOAD NEXT PIXEL WORD
2280  014506  000771                            BR      3$                      ;NEXT MAP LOAD
2281  014510  012700  000040            4$:     MOV     #40,R0                  ;SET UP BIT MAP ADRS SIDE LINES
2282  014514  012701  000007            5$:     MOV     #7,R1                   ;SET UP PIXEL 0 DATA IN R1 - INT 7
2283  014520  004737  015770                    JSR     PC,DISPY                ;GO LOAD BIT MAP
2284  014524  012701  070000                    MOV     #70000,R1               ;SET UP PIXEL 3 DATA IN R1 - INT 7
2285  014530  062700  000037                    ADD     #37,R0                  ;OFFSET TO RIGHT SIDE LINE
2286  014534  004737  015770                    JSR     PC,DISPY                ;GO LOAD BIT MAP
2287  014540  005200                            INC     R0                      ;GO TO NEXT ROW ON LEFT
2288  014542  022700  007740                    CMP     #7740,R0                ;TO BOTTOM YET?
2289  014546  001362                            BNE     5$                      ;BR IF NOT
2290  014550  005077  164712                    CLR     @VGCOLR                 ;LOAD L.U.T. 0
2291  014554  012777  003417  164704            MOV     #3417,@VGCOLR           ;LOAD L.U.T. 7
2292                                    ;NOW DISPLAY NORMAL SIZE BOX
2293  014562  012777  002400  164670            MOV     #BIT10!BIT8,@VGCSR      ;ENABLE MAP
2294  014570  004537  016666                    JSR     R5,DELAY                ;DELAY FOR OPERATOR
2295  014574  000144                            100.
```

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2296                                    ;NOW DISPLAY EXPANDED SIZE BOX
2297  014576  052777  004000  164654            BIS     #BIT11,@VGCSR           ;EXPAND MAP
2298  014604  004537  016666                    JSR     R5,DELAY                ;DELAY FOR OPERATOR
2299  014610  000144                            100.
2300                                    ;;*****************************************************************
2301                                    ;*TEST 74       TEST THE 'ORIGIN' FUNCTION
2302                                    ;;*****************************************************************
2303  014612  000004                    TST74:  SCOPE
2304  014614  005737  001200                    TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
2305  014620  001434                            BEQ     TST75           ;;BR IF FIRST PASS
2306  014622  032777  001000  164310            BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
2307  014630  001030                            BNE     TST75           ;;BR IF INHIBIT IS SET
2308  014632  004737  017306                    JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
2309  014636  004737  016234                    JSR     PC,CLRMAP               ;CLEAR THE MAP
2310  014642  012777  000017  164616            MOV     #17,@VGCOLR             ;LOAD MAX INTENSITY INTO TABLE LOC. 0
2311  014650  012777  002400  164602            MOV     #BIT10!BIT8,@VGCSR      ;ENABLE THE BIT MAP
2312  014656  005037  001474                    CLR     $TEMP
2313  014662  113777  001474  164570  1$:       MOVB    $TEMP,@VGCSR            ;LOAD ORIGIN REGISTER
2314  014670  004537  016666                    JSR     R5,DELAY
2315  014674  000144                            100.
2316  014676  105237  001474                    INCB    $TEMP                   ;UPDATE THE ORIGIN POSITION
2317  014702  122737  000020  001474            CMPB    #20,$TEMP               ;TEST FOR A NON-VALID ORIGIN
2318  014710  001364                            BNE     1$                      ;BR IF A VALID ORIGIN
2319
2320                                    ;;*****************************************************************
2321                                    ;*TEST 75       INTENSITY LEVEL TEST-MONOCROME
2322                                    ;;*****************************************************************
2323  014712  000004                    TST75:  SCOPE
2324  014714  005737  001200                    TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
2325  014720  001435                            BEQ     TST76           ;;BR IF FIRST PASS
2326  014722  032777  001000  164210            BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
2327  014730  001031                            BNE     TST76           ;;BR IF INHIBIT IS SET
2328  014732  004737  017306                    JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
2329  014736  004737  016234                    JSR     PC,CLRMAP               ;CLEAR THE BIT MAP
2330  014742  004737  016774                    JSR     PC,LODSEQ               ;LOAD TWO WORDS PER LOOK TABLE LOCATION
2331  014746  005037  014764                    CLR     2$                      ;CLEAR STARTING INTENSITY LEVEL
2332  014752  012777  006400  164500            MOV     #BIT11!BIT10!BIT8,@VGCSR        ;SET MONOCROME + ENABLE MAP
2333  014760  004537  017062          1$:       JSR     R5,LODSTA               ;LOAD SEQUENCE
2334  014764  000000                  2$:       0                               ;INDEX INTO DATA VALVE TABLE
2335  014766  016446                            TABLE1
2336  014770  004537  016666                    JSR     R5,DELAY
2337  014774  000144                            100.
2338  014776  062737  000001  014764            ADD     #1,2$                   ;UPDATE INDEX INTO TABLE FOR LOCATION 0'S VALUE
2339  015004  022737  000020  014764            CMP     #20,2$                  ;TEST IF LAST VLUE FOR MONOCROME
2340  015012  001362                            BNE     1$                      ;BR IF MORE LEVELS FOR LOCATION 0
```

```
2341                                    ;;*****************************************************************
2342                                    ;*TEST 76        TEST THE GREEN BITS
2343                                    ;;*****************************************************************
2344  015014  000004                    TST76:  SCOPE
2345  015016  005737  001200                    TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
2346  015022  001435                            BEQ     TST77           ;;BR IF FIRST PASS
2347  015024  032777  001000  164106            BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
2348  015032  001031                            BNE     TST77           ;;BR IF INHIBIT IS SET
2349  015034  004737  017306                    JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
2350  015040  004737  016234                    JSR     PC,CLRMAP               ;CLEAR THE MAP
2351  015044  012777  004400  164406            MOV     #BIT11!BIT8,@VGCSR      ;ENABLE MAP AND EXPAND
2352  015052  012777  000004  164406            MOV     #4,@VGCOLR              ;LOAD TABLE POINTERO - LOW GREEN LEVEL
2353  015060  004537  016666                    JSR     R5,DELAY
2354  015064  000144                            100.
2355  015066  012777  000010  164372            MOV     #10,@VGCOLR             ;SET THE MEDIUM GREEN LEVEL
2356  015074  004537  016666                    JSR     R5,DELAY
2357  015100  000144                            100.
2358  015102  012777  000014  164356            MOV     #14,@VGCOLR             ;SET THE BRIGHTEST BREEN LEVEL
2359  015110  004537  016666                    JSR     R5,DELAY
2360  015114  000144                            100.
2361
2362                                    ;;*****************************************************************
2363                                    ;*TEST 77        TEST THE RED BITS
2364                                    ;;*****************************************************************
2365  015116  000004                    TST77:  SCOPE
2366  015120  005737  001200                    TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
2367  015124  001435                            BEQ     TST100          ;;BR IF FIRST PASS
2368  015126  032777  001000  164004            BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
2369  015134  001031                            BNE     TST100          ;;BR IF INHIBIT IS SET
2370  015136  004737  017306                    JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
2371  015142  004737  016234                    JSR     PC,CLRMAP
2372  015146  012777  004400  164304            MOV     #BIT11!BIT8,@VGCSR      ;ENABLE MAP AND EXPAND
2373  015154  012777  000001  164304            MOV     #1,@VGCOLR              ;SET THE DIMMEST RED LEVEL
2374  015162  004537  016666                    JSR     R5,DELAY
2375  015166  000144                            100.
2376  015170  012777  000002  164270            MOV     #2,@VGCOLR              ;SET THE MEDIUM RED LEVEL
2377  015176  004537  016666                    JSR     R5,DELAY
2378  015202  000144                            100.
2379  015204  012777  000003  164254            MOV     #3,@VGCOLR              ;SET THE BRIGHTEST RED LEVEL
2380  015212  004537  016666                    JSR     R5,DELAY
2381  015216  000144                            100.
2382
```

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                                ;;*****************************************************************
                                ;*TEST 100       TEST THE BLUE COLOR BITS AT TABLE ADDRESS 0
                                ;;*****************************************************************
015220  000004                  TST100: SCOPE
015222  005737  001200                  TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
015226  001435                          BEQ     TST101          ;;BR IF FIRST PASS
015230  032777  001000  163702          BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
015236  001031                          BNE     TST101          ;;BR IF INHIBIT IS SET
015240  004737  017306                  JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
015244  004737  016234                  JSR     PC,CLRMAP
015250  012777  004400  164202          MOV     #BIT11!BIT8,@VGCSR      ;ENABLE MAP AND EXPAND
015256  012777  000020  164202          MOV     #20,@VGCOLR             ;SET THE DIMMEST BLUE LEVEL
015264  004537  016666                  JSR     R5,DELAY
015270  000144                          100.
015272  012777  000040  164166          MOV     #40,@VGCOLR             ;SET THE MEDIUM BLUE LEVEL
015300  004537  016666                  JSR     R5,DELAY
015304  000144                          100.
015306  012777  000060  164152          MOV     #60,@VGCOLR             ;SET THE BRIGHTEST BLUE LEVEL
015314  004537  016666                  JSR     R5,DELAY
015320  000144                          100.
```

```
                                ;;*****************************************************************
                                ;*TEST 101       COLOR LEVEL TEST - COLORCROME
                                ;;*****************************************************************
015322  000004                  TST101: SCOPE
015324  005737  001200                  TST     $PASS                   ;TEST IF FIRST PASS OF PROGRAM
015330  001441                          BEQ     TST102          ;;BR IF FIRST PASS
015332  032777  001000  163600          BIT     #SW09,@SWR              ;TEST IF INHIBIT VISUAL MAP PATTERNS
015340  001035                          BNE     TST102          ;;BR IF INHIBIT IS SET
015342  004737  017306                  JSR     PC,TESTID               ;DISPLAY MAP # AND TEST #
015346  004737  016234                  JSR     PC,CLRMAP               ;ENSURE CLEAR MAP
015352  004737  016774                  JSR     PC,LODSEQ               ;LOAD TWO WORDS PER LOOKUP TABLE LOC.
015356  005037  015372                  CLR     2$                      ;CLEAR INDEX POINTER
015362  005077  164072                  CLR     @VGCSR                  ;CLEAR STATUS
015366  004537  017062          1$:     JSR     R5,LODSTA               ;LOAD DATA INTO TABLE
015372  000000                  2$:     0
015374  016546                          TABLE5
015376  012777  004400  164054          MOV     #BIT11!BIT8,@VGCSR      ;ENABLE MAP
015404  004537  016666                  JSR     R5,DELAY
015410  000144                          100.
015412  062737  000001  015372          ADD     #1,2$                   ;UPDATE LOC 0 INDEX INTO TABLE
015420  022737  000020  015372          CMP     #20,2$                  ;TEST IF FINISHED FOR LOC 0
015426  001357                          BNE     1$                      ;
015430  005077  164024                  CLR     @VGCSR                  ;DISABLE MAP


                                ;;*****************************************************************
                                ;*TEST 102       LOGICAL END OF BIT MAP TEST
                                ;;*****************************************************************
015434  000004                  TST102: SCOPE
015436  000137  007174                  JMP     MAPRET                  ;RETURN AND TEST IF MORE MAPS

                                        .SBTTL
                                        .SBTTL  OPERATOR INTERVENTION AND INSPECTION TESTS
                                        .SBTTL
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                                        .SBTTL  CROSS HATCH TEST PATTERN

015442  012706  001100          HATCH:  MOV     #STACK,SP               ;LOAD SP
015446  004737  003576                  JSR     PC,LODADR               ;LOAD BUS ADDRESSES FOR MAP #1
015452  004737  015510                  JSR     PC,HATCHO               ;LOAD MAP #0
015456  012777  004400  163774          MOV     #BIT11!BIT8,@VGCSR      ;ENABLE MAP EXPAND AND ORGIN =0
015464  004737  003730                  JSR     PC,MOVADR               ;ADJUST BUS ADDRESSES TO MAP #1
015470  004737  015510                  JSR     PC,HATCHO               ;LOAD MAP #1
015474  012777  004402  163756          MOV     #BIT11!BIT8!BIT1,@VGCSR ;ENABLE MAP, EXPAND AND ORIGIN =2
015502  000000                        HALT
015504  000137  001572                  JMP     BEGIN

                                    ;ACTUAL LOADING OF CROSS HATCH INTO BIT MAP SUB-ROUTINE

015510  004737  016234          HATCHO: JSR     PC,CLRMAP               ;ENSURE CLEAR MAP
015514  012737  000022  015636          MOV     #22,10$                 ;LOAD VERT. COUNTER
015522  005077  163734                  CLR     @VGPC                   ;CLEAR MAP P.C.
015526  012701  000040          1$:     MOV     #32.,R1                 ;LOAD WIDTH COUNTER
015532  105777  163722          2$:     TSTB    @VGCSR                  ;TEST IF MAP READY SET
015536  100375                          BPL     2$                      ;BR IF NOT READY
015540  012777  177777  163716          MOV     #-1,@VGBUF              ;LOAD #17 INTO ALL PIXELS
015546  005301                          DEC     R1
015550  001370                          BNE     2$                      ;BR UNTIL FINISHED
015552  012737  000140  015640          MOV     #140,11$                ;LOAD VERT COUNT
015560  105777  163674          3$:     TSTB    @VGCSR                  ;TEST IF MAP READY IS SET
015564  100375                          BPL     3$                      ;BR IF NOT
015566  012777  000017  163670          MOV     #17,@VGBUF              ;LOAD VERT LINE PIXEL
015574  105777  163660          4$:     TSTB    @VGCSR                  ;TEST IF READY
015600  100375                          BPL     4$                      ;WAIT IF NOT
015602  005077  163656                  CLR     @VGBUF                  ;CLEAR PIXELS

015606  005337  015640                  DEC     11$
015612  001362                          BNE     3$                      ;BR UNTIL FUNISHED SEVERAL ROWS OF PIXELS

015614  005337  015636                  DEC     10$                     ;TEST IF FINISHED THE SCREEN
015620  001342                          BNE     1$                      ;BR IF NOT

015622  005077  163640                  CLR     @VGCOLR                 ;CLEAR L.U.T. 0
015626  012777  007477  163632          MOV     #7477,@VGCOLR           ;LOAD "WHITE" INTO L.U.T. #17
015634  000207                          RTS     PC                      ;EXIT

015636  000000          10$:    0
015640  000000          11$:    0

                                        .SBTTL  SWR CONTROL OF X AND Y CROSS HAIRS LOOP
015642  012706  001100          CROSS:  MOV     #STACK,SP               ;LOAD STACK
015646  004737  003576                  JSR     PC,LODADR               ;LOAD DEVICE ADDRESS
015652  012777  014000  163566          MOV     #BIT12!BIT11,@VCCSR     ;ENABLE CROSS HAIRS
015660  104407          1$:     CKSWR                                   ;TEST FOR CTRL G
015662  017777  163252  163560          MOV     @SWR,@VCHRLO            ;LOAD THE CROSS HAIR POSITION REGISTERS
015670  000773                          BR      1$                      ;LOOP PACK
```

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                                        .SBTTL
                                        .SBTTL  MISC SUBROUTINES
                                        .SBTTL
                                .SBTTL  SUBROUTINE TO TEST THAT 'VERT SYNC' BIT CHANGES, REPORT ERROR IF
                                        ;BIT DOES NOT CHANGE STATES (0 TO 1 OR 1 TO 0)
015672  005237  015766          COUNTA: INC     CNTSAV                  ;SET EXIT FLAG
015676  012702  040000          COUNT:  MOV     #BIT14,R2               ;LOAD BIT 14
015702  005001                          CLR     R1                      ;CLEAR COUNT LOC.
015704  013700  001446                  MOV     VCCSR,R0                ;LOAD BUS ADDRESS
015710  030210                          BIT     R2,(R0)                 ;TEST IF BIT IS SET
015712  001411                          BEQ     3$                      ;BR IF SET
                                ;COME HERE IF BIT 14 WAS INITIALLY SET - NOW WAIT FOR IT TO CLEAR
015714  005201                  1$:     INC     R1                      ;COUNT TIME
015716  001002                          BNE     2$                      ;BR IF NOT OVERFLOW
015720  104005                          ERROR   5                       ;VERTICAL SYNC FLAG ERROR
015722  000207                          RTS     PC                      ;EXIT
015724  030210                  2$:     BIT     R2,(R0)                 ;TEST IF BIT 14 IS CLEARED
015726  001372                          BNE     1$                      ;BR IF STILL SET
015730  005037  015766                  CLR     CNTSAV                  ;CLEAR EXIT FLAG
015734  000207                          RTS     PC                      ;EXIT
                                ;COME HERE IF BIT 14 WAS INITIALLY CLEARED - NOW WAIT FOR IT TO SET
015736  005201                  3$:     INC     R1                      ;COUNT TIME
015740  001002                          BNE     4$                      ;BR IF NOT OVERFLOW
015742  104005                          ERROR   5                       ;VERTICAL SYNC FLAG ERROR
015744  000207                          RTS     PC                      ;EXIT
015746  030210                  4$:     BIT     R2,(R0)                 ;TEST IF BIT 14 IS SET
015750  001772                          BEQ     3$                      ;BR IF CLEARED
015752  005737  015766                  TST     CNTSAV                  ;TEST IF EXIT FLAG IS SET
015756  001347                          BNE     COUNT                   ;BR IF SET
015760  005037  015766                  CLR     CNTSAV                  ;CLEAR AGAIN
015764  000207                          RTS     PC                      ;EXIT
015766  000000          CNTSAV: 0

015770  042777  000400  163462  DISPY:  BIC     #400,@VGCSR             ;DISABLE MAP
015776  010077  163460                  MOV     R0,@VGPC                ;LOAD MAP P.C.
016002  042777  000400  163450  DCONT:  BIC     #400,@VGCSR             ;DISABLE MAP
016010  105777  163444          1$:     TSTB    @VGCSR                  ;TEST IF MAP IS READY
016014  100375                          BPL     1$
016016  010177  163442                  MOV     R1,@VGBUF               ;LOAD A PIXEL
016022  052777  000400  163430          BIS     #400,@VGCSR             ;ENABLE MAP
016030  000207                          RTS     PC                      ;EXIT
```

```
2531                                            .SBTTL  DISPLAY BUFFER ON VTV01 SCREEN SUB-ROUTINE
2532
2533  016032  012700  024330          XPRNT:  MOV     #BUFFER,R0              ;LOAD BUFFER POINTER
2534  016036  000240                  XPRNTA: NOP
2535  016040  000240                          NOP
2536  016042  000240                          NOP
2537  016044  005777  163376          1$:     TST     @VCCSR                  ;TEST IF READY IS SET
2538  016050  100375                          BPL     1$                      ;WAIT TILL DONE
2539  016052  112077  163370                  MOVB    (R0)+,@VCCSR            ;LOAD THE CHARACTER
2540  016056  122710  000377                  CMPB    #377,(R0)               ;TEST FOR TERM
2541  016062  001370                          BNE     1$                      ;BR IF NOT TERM.
2542  016064  000240                          NOP
2543  016066  000240                          NOP
2544  016070  000240                          NOP
2545  016072  000240                          NOP
2546  016074  000207                          RTS     PC                      ;EXIT
2547
2548  016076  013701  001500          FILLWC: MOV     KE,R1                   ;LOAD BASIC CHARACTER
2549  016102  004737  016132                  JSR     PC,FILBUF               ;LOAD BUFFER WITH THE CHARACTER
2550  016106  013737  001524  016130          MOV     VHO,10$                 ;LOAD VERTICAL COUNTER
2551  016114  004737  016032          1$:     JSR     PC,XPRNT                ;DISPLAY A LINE
2552  016120  005337  016130                  DEC     10$                     ;FINISHED ALL VERT LINES ?
2553  016124  100373                          BPL     1$                      ;BR IF NOT
2554  016126  000207                          RTS     PC                      ;EXIT
2555  016130  000000          10$:    0
2556
2557  016132  013702  001522          FILBUF: MOV     WIDTH,R2                ;LOAD WIDTH VALUE
2558  016136  012700  024330                  MOV     #BUFFER,R0              ;SET-UP BUFFER POINTER
2559  016142  110120          1$:     MOVB    R1,(R0)+                ;SAVE THE CHARACTER IN THE BUFFER
2560  016144  005302                  DEC     R2                      ;FINISHED?
2561  016146  001375                  BNE     1$                      ;BRANCH IF NOT COMPLETED
2562  016150  112720  000015                  MOVB    #15,(R0)+               ;LOAD "CR"
2563  016154  112720  000012                  MOVB    #12,(R0)+                       ;LOAD "LF"
2564  016160  112710  000377                  MOVB    #377,(R0)               ;LOAD TERM.
2565  016164  000207                          RTS     PC                      ;EXIT
2566
2567                                    ;LOAD A INCREMENTING CHARACTER ACROSS THE SCREEN WIDTH
2568                                    ;ONLY 40 THRU 177 ARE LEGAL CHARACTERS
2569
2570  016166  012700  024330          LIC:    MOV     #BUFFER,R0              ;SET-UP BUFFER POINTER
2571  016172  013502                          MOV     @(5)+,R2                ;SET-UP WIDTH
2572  016174  110120          1$:     MOVB    R1,(0)+                 ;SAVE A CHARACTER IN THE BUFFER
2573  016176  005201                  INC     R1                      ;UPDATE THE CHARACTER
2574  016200  023701  001532                  CMP     LASTCH,R1               ;TEST FOR
2575  016204  001002                          BNE     2$                      ;BRANCH IF NOT
2576  016206  012701  000040                  MOV     #40,R1                  ;MAKE A LEGAL CHARACTER
2577  016212  005302          2$:     DEC     R2                      ;DECREMENT COUNT
2578  016214  001367                          BNE     1$                      ;BRANCH IF NOT COMPLETED
2579  016216  112720  000015                  MOVB    #15,(R0)+               ;LOAD "CR"
2580  016222  112720  000012                  MOVB    #12,(R0)+               ;LOAD "LF"
2581  016226  112710  000377                  MOVB    #377,(R0)               ;LOAD TERM
2582  016232  000205                          RTS     R5                      ;EXIT
2583
```

```
2584                                        ;SUBROUTINE TO CLEAR THE BIT MAP
2585                                        ;
2586  016234  012737  000100  016316  CLRMAP: MOV     #BIT6,10$               ;LOAD BASE DELAY
2587  016242  005037  016320                  CLR     11$                     ;CLEAR COUNTER
2588  016246  004537  016666                  JSR     R5,DELAY
2589  016252  100001                          BIT15!1
2590  016254  000240                          NOP
2591  016256  000240                          NOP
2592  016260  000240                          NOP
2593  016262  012777  001000  163170          MOV     #BIT9,@VGCSR            ;SET 'CLEAR MAP' BIT
2594  016270  105777  163164          1$:     TSTB    @VGCSR                  ;TEST READY FLAG
2595  016274  100407                          BMI     2$                      ;BR IF READY SET
2596  016276  005237  016320                  INC     11$                     ;UPDATE COUNTER
2597  016302  001372                          BNE     1$                      ;BR IF NO OVERFLOW
2598  016304  005337  016316                  DEC     10$                     ;DECREMENT BASE DELAY
2599  016310  001367                          BNE     1$                      ;BR IF NO OVERFLOW
2600  016312  104015                          ERROR   15                      ;MAP READY FAILED TO SET AFTER A GROSS
2601                                                                          ;TIME DELAY
2602  016314  000207                  2$:     RTS     PC                      ;EXIT
2603
2604  016316  000000                  10$:    0                               ;BASE DELAY
2605  016320  000000                  11$:    0                               ;COUNT LOCATION
2606
2607                                        .SBTTL  CROSS HAIRS WITH 2 BIT MAPS ENABLED
2608
2609  016322  012706  001100          FRANKD: MOV     #STACK,SP
2610  016326  004737  003576                  JSR     PC,LODADR               ;LOAD DEVICE ADDRESS
2611  016332  004737  016234                  JSR     PC,CLRMAP
2612  016336  012777  000014  163122          MOV     #14,@VGCOLR             ;LOAD LUT TO GREEN
2613  016344  012777  000400  163106          MOV     #BIT8,@VGCSR            ;ENABLE THE MAP
2614  016352  004737  003730                  JSR     PC,MOVADR               ;UPDATE TO NEXT MAP ADDRESS
2615  016356  004737  016234                  JSR     PC,CLRMAP
2616  016362  012777  000014  163076          MOV     #14,@VGCOLR             ;LOAD LUT TO GREEN
2617  016370  012777  004404  163062          MOV     #BIT11!BIT8!4,@VGCSR    ;ENABME MAP - EXPAND - ORIGIN 4
2618  016376  012777  014000  163042          MOV     #BIT12!BIT11,@VCCSR     ;ENABLE CROSS HAIRS
2619  016404  104407                  1$:     CKSWR                           ;TEST FOR CTRL G
2620  016406  017777  162526  163034          MOV     @SWR,@VCHRLO            ;LOAD CROSS HAIR OGIGIN
2621  016414  000773                          BR      1$
2622
2623                                        .SBTTL  BUR TIME-OUT LOOP
2624
2625  016416  012706  001100          BUSOUT: MOV     #STACK,SP               ;LOAD SP
2626  016422  012737  016440  000004          MOV     #2$,ERRVEC              ;LOAD BUS TRAP RETURN
2627  016430  005777  162612          1$:     TST     @$BASE                  ;REFERENCE THE ADDRESS
2628  016434  000775                          BR      1$
2629  016436  000240                          NOP
2630  016440  022626                  2$:     CMP     (SP)+,(SP)+             ;CLEAN THE STACK
2631  016442  000772                          BR      1$
2632  016444  000240                          NOP
```

```
2633  016446  000  001  002  TABLE1: .BYTE   0,1,2,3,4,5,6,7,10,11,12,13,14,15,16,17
2634  016451  003  004  005
2635  016454  006  007  010
2636  016457  011  012  013
2637  016462  014  015  016
2638  016465  017
2639  016466  000  017  000  TABLE2: .BYTE   0,17,0,0,0,0,0,0,0,0,0,0,0,0,0,0        ;L.U.(.1 = 17 OTHERS =0
2640  016471  000  000  000
2641  016474  000  000  000
2642  016477  000  000  000
2643  016502  000  000  000
2644  016505  000
2645  016506  014  063  063  TABLE3: .BYTE   14,63,63,63,63,63,63,63,63,63,63,63,63,63,63,63
2646  016511  063  063  063
2647  016514  063  063  063
2648  016517  063  063  063
2649  016522  063  063  063
2650  016525  063
2651  016526  004  017  004  TABLE4: .BYTE   4,17,4,4,4,4,4,4,4,4,4,4,4,4,4,4
2652  016531  004  004  004
2653  016534  004  004  004
2654  016537  004  004  004
2655  016542  004  004  004
2656  016545  004
2657  016546  001  002  003  TABLE5: .BYTE   1,2,3,4,10,14,20,40,60,63,74,17,33,25,52,77
2658  016551  004  010  014
2659  016554  020  040  060
2660  016557  063  074  017
2661  016562  033  025  052
2662  016565  077
2663  016566  001  002  003          .BYTE   1,2,3,4,10,14,20,40,60,63,74,17,33,25,52,77
2664  016571  004  010  014
2665  016574  020  040  060
2666  016577  063  074  017
2667  016602  033  025  052
2668  016605  077
2669  016606  000  000  017  TABLE6: .BYTE   0,0,17,0,0,0,0,0,0,0,0,0,0,0,0,0        ;L.U.T. 2 = 17  OTHERS = 0
2670  016611  000  000  000
2671  016614  000  000  000
2672  016617  000  000  000
2673  016622  000  000  000
2674  016625  000
2675  016626  000  000  000  TABLE7: .BYTE   0,0,0,0,17,0,0,0,0,0,0,0,0,0,0,0        ;L.U.T. 4 = 17  OTHERS = 0
2676  016631  000  017  000
2677  016634  000  000  000
2678  016637  000  000  000
2679  016642  000  000  000
2680  016645  000
2681  016646  000  000  000  TABLE8: .BYTE   0,0,0,0,0,0,0,0,17,0,0,0,0,0,0,0        ;L.U.T. 10 = 17  OTHERS = 0
2682  016651  000  000  000
2683  016654  000  000  017
2684  016657  000  000  000
2685  016662  000  000  000
2686  016665  000
2687                          .EVEN
```

```
2688
2689                                    .SBTTL  DELAY SUBROUTINE -- WAIT FOR "VERTICAL SYNC INTERRUPT"
2690
2691  016666  012777  016772  162574  DELAY:  MOV     #5$,@VCINT              ;LOAD INTR. RETURN ADDRESS
2692  016674  012777  000200  162570          MOV     #APRIOR,@VCINT1         ;LOAD RETURN PRIORITY
2693  016702  012537  016770                  MOV     (R5)+,10$               ;GET THE ARG.
2694  016706  100003                          BPL     2$                      ;BR IF POSITIVE
2695
2696  016710  005737  016770          1$:     TST     10$                     ;TEST IF DELAY CANNOT BE INHIBITED
2697  016714  100404                          BMI     3$                      ;BR IF IT CANT
2698  016716  032777  010000  162214  2$:     BIT     #BIT12,@SWR             ;TEST IF INHIBIT DELAY SWITCH IS SET
2699  016724  001013                          BNE     4$                      ;BR IF INHIBIT IS SET
2700  016726  052777  020000  162512  3$:     BIS     #BIT13,@VCCSR           ;ENABLE SYNC INTR.
2701  016734  000001                          WAIT                            ;WAIT FOR INTERRUPT TO HAPPEN
2702  016736  042777  020000  162502          BIC     #BIT13,@VCCSR           ;DISABLE INTR.
2703  016744  104407                          CKSWR                   ;TEST FOR CTRL G
2704  016746  105337  016770                  DECB    10$                     ;FINISHED DELAY ?
2705  016752  001356                          BNE     1$                      ;BR IF NOT
2706  016754  013777  001472  162506  4$:     MOV     VCINT1,@VCINT           ;RESET INTR. VECTOR
2707  016762  005077  162504                  CLR     @VCINT1                 ;
2708  016766  000205                          RTS     R5                      ;EXIT
2709
2710  016770  000000          10$:    0
2711  016772  000002          5$:     RTI                                     ;CONTINUE
2712
2713
2714                                    ;LOAD MAP WITH TWO WORDS OF THE SAME VALUE
2715                                    ;       INTO THE ENTIRE BITMAP STARTING AT LOC. 0
2716
2717  016774  010046          LODSEQ: MOV     R0,-(SP)                ;SAVE R0
2718  016776  010146                  MOV     R1,-(SP)                ;SAVE R1
2719  017000  005077  162456          CLR     @VGPC                   ;ENSURE CLEAR PC
2720  017004  013701  001542          MOV     NUMPIX,R1               ;LOAD COUNTER
2721  017010  006201                  ASR     R1                      ;ADJUST COUNT
2722
2723  017012  005000          1$:     CLR     R0                      ;START WITH PIXEL VALUE OF 0
2724  017014  105777  162440  2$:     TSTB    @VGCSR                  ;ENSURE MAP IS READY
2725  017020  100375                  BPL     2$
2726  017022  010077  162436          MOV     R0,@VGBUF               ;LOAD A PIXEL WORD
2727  017026  105777  162426  3$:     TSTB    @VGCSR                  ;ENSURE MAP IS READY
2728  017032  100375                  BPL     3$
2729  017034  010077  162424          MOV     R0,@VGBUF               ;LOAD 2ND PIXEL WORD
2730  017040  005301                  DEC     R1                      ;FINISHED ALL PIXELS ?
2731  017042  100404                  BMI     4$                      ;BR IF FINISHED
2732  017044  062700  010421          ADD     #10421,R0               ;UPDATE PIXEL DATA TO NEXT L.U.T. ADDRESS
2733  017050  103361                  BCC     2$                      ;BR IF MORE ADDRESSES TO LOAD
2734  017052  000757                  BR      1$                      ;BR TO RESET PIXEL DATA
2735
2736  017054  012601          4$:     MOV     (SP)+,R1                ;RESTORE R1
2737  017056  012600                  MOV     (SP)+,R0                ;RESTORE R0
2738  017060  000207                  RTS     PC                      ;EXIT
2739
```

```
                                        .SBTTL  SUBROUTINE TO LOAD THE L.U.T. WITH THE VALUE OF A TABLE

017062  010046                LODSTA: MOV     R0,-(SP)                ;SAVE R0
017064  012537  017136                MOV     (R5)+,10$               ;GET STARTING LUT ADDRESS
017070  012500                        MOV     (R5)+,R0                ;GET TABLE ADDRESS
017072  012737  000020  017140        MOV     #16.,11$                ;LOAD COUNTER

017100  113737  017136  017143        MOVB    10$,12$+1               ;LOAD HIGH BYTE WITH LUT ADDRESS
017106  112037  017142        1$:     MOVB    (R0)+,12$               ;LOAD VALUE INTO LOW BYTE
017112  013777  017142  162346        MOV     12$,@VGCOLR             ;LOAD THE TABLE
017120  105237  017143                INCB    12$+1                   ;UPDATE THE LUT POINTER
017124  005337  017140                DEC     11$                     ;FINISHED ALL L.U.T. ADDRESSES
017130  001366                        BNE     1$                      ;BR IF NOT
017132  012600                        MOV     (SP)+,R0                ;RESTORE R0
017134  000205                        RTS     R5                      ;EXIT

017136  000000                10$:    0
017140  000020                11$:    16.                             ;COUNTER OF L.U.T.
017142  000000                12$:    0                               ;TEMP LOCATION

017144  000000                YADDS:  0
017146  000000                XADDS:  0
017150  000000                SET:    0
017152  000000                OVRAL:  0
017154  051526  030126  026461 MSGTXT: .ASCII  \VSV01-DYNAMIC-CURSOR-ADDRESS-TEST-\
017162  054504  040516  044515
017170  026503  052503  051522
017176  051117  040455  042104
017204  042522  051523  052055
017212  051505  026524
017216  042055  043511  052111        .ASCII  \-DIGITAL-EQUIPMENT-CORPORATION\
017224  046101  042455  052521
017232  050111  042515  052116
017240  041455  051117  047520
017246  040522  044524  047117
017254  100000                MSGTND: BIT15
```

```
                                        .SBTTL  HOME THE DISPLAY SUBROUTINE
017256  004537  016666          HOME:   JSR     R5,DELAY                ;WAIT FOR VERT SYNC
017262  100001                  BIT15!BIT0
017264  012737  177435  024330          MOV     #177435,BUFFER          ;LOAD "HOME" AND TERMINATOR
017272  004737  016032                  JSR     PC,XPRNT                ;EXECUTE
017276  005777  162144          1$:     TST     @VCCSR                  ;WAIT FOR CHAR READY
017302  100375                  BPL     1$
017304  000207                  RTS     PC                              ;RETURN

                                        .SBTTL  DISPLAY BIT MAP # AND TEST #
017306  032777  010000  161624  TESTID: BIT     #BIT12,@SWR             ;TEST IF INHIBIT DELAY IS SET
017314  001071                  BNE     3$                              ;BR AND DONT DISPLAY THIS STUFF
017316  112737  000060  017525          MOVB    #'0,MAPIND-1            ;LOAD 1 DIGIT VALUE
017324  013737  001546  017502          MOV     COAXSW,10$              ;SAVE COAX SWITCH VALUE
017332  006237  017502          4$:     ASR     10$                     ;CONVERT TO A ASCII DIGIT
017336  103403                  BCS     5$
017340  105237  017525                  INCB    MAPIND-1
017344  000772                  BR      4$
017346  012737  000060  017502  5$:     MOV     #'0,10$                 ;LOAD MAP # INDICATOR
017354  063737  001204  017502          ADD     $UNIT,10$               ;ADD CURRENT MAP I.D.
017362  113737  017502  017526          MOVB    10$,MAPIND              ;SAVE IN A MESSAGE
017370  013700  001102          1$:     MOV     $TSTNM,R0               ;LOAD TEST #
017374  112737  000060  017550          MOVB    #'0,TSTIND              ;LOAD 0
017402  032700  000100                  BIT     #BIT6,R0                ;TEST IF TEST # > 100
017406  001402                  BEQ     2$
017410  105237  017550                  INCB    TSTIND                  ;MAKE TEST # 100
017414  010001                  2$:     MOV     R0,R1
017416  042701  177770                  BIC     #177770,R1              ;MASK LOWER BITS
017422  062701  000060                  ADD     #60,R1                  ;MAKE IT ASCII
017426  110137  017552                  MOVB    R1,TSTIND+2             ;LOAD MESSAGE
017432  006200                  ASR     R0
017434  006200                  ASR     R0
017436  006200                  ASR     R0
017440  042700  177770                  BIC     #177770,R0              ;MASK LOWER BITS
017444  062700  000060                  ADD     #60,R0                  ;UPDATE TO ASCII
017450  110037  017551                  MOVB    R0,TSTIND+1             ;UPDATE MESSAGE
017454  112777  000014  161772          MOVB    #14,@VCPOS              ;LOAD X POSITION
017462  112777  000030  161766          MOVB    #24.,@VCPOSH            ;LOAD Y POSITION
017470  012700  017504                  MOV     #BRIAN,R0               ;LOAD MESSAGE POINTER
017474  004737  016036                  JSR     PC,XPRNTA               ;DISPLAY MESSAGE
017500  000207                  3$:     RTS     PC                      ;EXIT
017502  000000                  10$:    0
017504  042524  052123  047111  BRIAN:  .ASCII  /TESTING BIT MAP #/
017512  020107  044502  020124
017520  040515  020120    043
017525    060                   .BYTE   60              ;1 DIGIT OF MAP #
017526    060                   .BYTE   60              ;2 DIGIT OF MAP #
017527    040  020040  052522  MAPIND: .ASCII  /   RUNNING TEST #/
017534  047116  047111  020107
017542  042524  052123  021440
017550    060    060    060    TSTIND: .BYTE   60,60,60,377
017553    377
                                        .EVEN
```

```
2829
2830  017554  012777  000202  161666  LDLIN:  MOV     #202,@VCHRLO            ;LOAD X CROSS HAIR LINE
2831  017562  052777  010000  161656          BIS     #BIT12,@VCCSR           ;ENABLE X CROSS HAIR
2832  017570  000207                          RTS     PC                      ;EXIT
2833
2834  017572  050000                  BYTST:  BIT14!BIT12
2835  017574  120000                          BIT15!BIT13
2836  017576  050000                          BIT14!BIT12
2837  017600  120000                          BIT15!BIT13
2838  017602  000000                          0
2839
2840                                  .SBTTL  RANDOM NUMBER GENERATOR ROUTINE
2841
2842                                  ;;**********************************************************************
2843                                  ;*THIS ROUTINE IS A DOUBLE PRECISION PSEUDO RANDOM NUMBER GENERATOR
2844                                  ;*WITH A RANGE OF 0 TO 2(+33)-1.
2845                                  ;*CALL:
2846                                  ;*      JSR     PC,$RAND        ;;CALL THE ROUTINE
2847                                  ;*      RETURN                  ;;RETURN HERE THE RANDOM
2848                                  ;*                              ;;NUMBER WILL BE IN
2849                                  ;*                              ;;$HINUM,$LONUM
2850
2851  017604                          $RAND:
2852  017604  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
2853  017606  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
2854  017610  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
2855  017612  013700  017704                  MOV     $LONUM,R0       ;;SET R0 WITH LOW
2856  017616  013701  017702                  MOV     $HINUM,R1       ;;SET R1 WITH HIGH
2857  017622  012702  177771                  MOV     #-7,R2          ;;SET SHIFT COUNT
2858  017626  006300                  1$:     ASL     R0              ;;SHIFT R0 LEFT AND
2859  017630  006101                          ROL     R1              ;;ROTATE CARRY INTO R1 AND
2860  017632  005202                          INC     R2              ;;CHECK FOR DONE
2861  017634  001374                          BNE     1$              ;;CONTINUE SHIFT LOOP
2862  017636  063700  017704                  ADD     $LONUM,R0       ;;ADD NUMBER TO MAKE X 129
2863  017642  005501                          ADC     R1              ;;PROPOGATE CARRY
2864  017644  063701  017702                  ADD     $HINUM,R1       ;;ADD NUMBER TO MAKE X 129
2865  017650  062700  001057                  ADD     #1057,R0        ;;ADD LOW CONSTANT
2866  017654  005501                          ADC     R1              ;;PROPOGATE CARRY
2867  017656  062701  047401                  ADD     #47401,R1       ;;ADD HIGH CONSTANT
2868  017662  010037  017704                  MOV     R0,$LONUM       ;;SAVE R0
2869  017666  010137  017702                  MOV     R1,$HINUM       ;;SAVE R1
2870  017672  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
2871  017674  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
2872  017676  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
2873  017700  000207                          RTS     PC              ;;RETURN
2874  017702  176543          $HINUM: .WORD   176543
2875  017704  123456          $LONUM: .WORD   123456
```

```
                                .SBTTL  SCOPE HANDLER ROUTINE

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

017706                          $SCOPE:
017706  104407                         CKSWR                   ;;TEST  FOR CHANGE IN SOFT-SWR
017710  104407                         CKSWR
017712  032777  040000  161220  1$:    BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
017720  001040                         BNE     $OVER           ;;YES IF SW14=1
                                ;#####START OF CODE FOR THE XOR TESTER#####
017722  000416                $XTSTR: BR      6$              ;;IF RUNNING ON THE "XOR" TESTER CHANGE
                                                                ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
017724  013746  000004                MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
017730  012737  017750  000004         MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
017736  005737  177060                TST     @#177060        ;;TIME OUT ON XOR?
017742  012637  000004                MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
017746  000414                       BR      $SVLAD          ;;GO TO THE NEXT TEST
017750  022626                5$:     CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
017752  012637  000004                MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
017756  000421                       BR      $OVER           ;;LOOP ON THE PRESENT TEST
017760                          6$:;#####END OF CODE FOR THE XOR TESTER#####
017760  032777  000400  161152         BIT     #BIT08,@SWR     ;;LOOP ON SPEC. TEST?
017766  001404                       BEQ     $SVLAD          ;;BR IF NO
017770  127737  161144  001102         CMPB    @SWR,$TSTNM     ;;ON THE RIGHT TEST?    SWR<7:0>
017776  001411                       BEQ     $OVER           ;;BR IF YES
020000  105237  001102        $SVLAD: INCB    $TSTNM          ;;COUNT TEST NUMBERS
020004  113737  001102  001176       MOVB    $TSTNM,$TESTN   ;;SET TEST NUMBER IN APT MAILBOX
020012  011637  001106               MOV     (SP),$LPADR     ;;SAVE SCOPE LOOP ADDRESS
020016  105037  001103               CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
020022  013777  001102  161112 $OVER: MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER
020030  013716  001106               MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
020034  000002                       RTI                     ;;FIXES PS
```

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

020036                          $ERROR:
020036  104407                          CKSWR                           ;;TEST FOR CHANGE IN SOFT-SWR
020040  105237  001103          7$:     INCB    $ERFLG                  ;;SET THE ERROR FLAG
020044  001775                          BEQ     7$                      ;;DON'T LET THE FLAG GO TO ZERO
020046  013777  001102  161066          MOV     $TSTNM,@DISPLAY         ;;DISPLAY TEST NUMBER AND ERROR FLAG
020054  005237  001112                  INC     $ERTTL                  ;;INC THE ERROR COUNT
020060  011637  001116                  MOV     (SP),$ERRPC             ;;GET ADDRESS OF ERROR INSTRUCTION
020064  162737  000002  001116          SUB     #2,$ERRPC
020072  117737  161020  001114          MOVB    @$ERRPC,$ITEMB          ;;STRIP AND SAVE THE ERROR ITEM CODE
020100  032777  020000  161032          BIT     #BIT13,@SWR             ;;SKIP TYPEOUT IF SET
020106  001004                          BNE     20$                     ;;SKIP TYPEOUTS
020110  004737  020174                  JSR     PC,$ERRTYP              ;;GO TO USER ERROR ROUTINE
020114  104401  001167                  TYPE    ,$CRLF
020120                          20$:
020120  122737  000001  001212          CMPB    #APTENV,$ENV            ;;RUNNING IN APT MODE
020126  001007                          BNE     2$                      ;;NO,SKIP APT ERROR REPORT
020130  113737  001114  020142          MOVB    $ITEMB,21$              ;;SET ITEM NUMBER AS ERROR NUMBER
020136  004737  021522                  JSR     PC,$ATY4                ;;REPORT FATAL ERROR TO APT
020142     000                  21$:    .BYTE   0
020143     000                          .BYTE   0
020144  000777                  22$:    BR      22$                     ;;APT ERROR LOOP
020146  005777  160766          2$:     TST     @SWR                    ;;HALT ON ERROR
020152  100002                          BPL     3$                      ;;SKIP IF CONTINUE
020154  000000                          HALT                            ;;HALT ON ERROR!
020156  104407                          CKSWR                           ;;TEST FOR CHANGE IN SOFT-SWR
020160                          3$:
020160  022737  003304  000042          CMP     #$ENDAD,@#42            ;;ACT-11 AUTO-ACCEPT?
020166  001001                          BNE     6$                      ;;BRANCH IF NO
020170  000000                          HALT                            ;;YES
020172                          6$:
020172  000002                          RTI                             ;;RETURN
```

```
                                .SBTTL  ERROR MESSAGE TYPEOUT ROUTINE

                                ;;**************************************************************************
                                ;*THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE WHICH
                                ;*ERROR IS TO BE REPORTED. IT THEN OBTAINS, FROM THE "ERROR TABLE" ($ERRTB),
                                ;*AND REPORTS THE APPROPRIATE INFORMATION CONCERNING THE ERROR.

020174                          $ERRTYP:
020174  104401  001167                TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
020200  010046                       MOV     R0,-(SP)        ;;SAVE R0
020202  005000                       CLR     R0              ;;PICKUP THE ITEM INDEX
020204  153700  001114               BISB    @#$ITEMB,R0
020210  001004                       BNE     1$              ;;IF ITEM NUMBER IS ZERO, JUST
                                                             ;;TYPE THE PC OF THE ERROR
020212  013746  001116               MOV     $ERRPC,-(SP)    ;;SAVE $ERRPC FOR TYPEOUT
                                                             ;;ERROR ADDRESS
020216  104402                       TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
020220  000426                       BR      6$              ;;GET OUT
020222  005300                1$:    DEC     R0              ;;ADJUST THE INDEX SO THAT IT WILL
020224  006300                       ASL     R0              ;;      WORK FOR THE ERROR TABLE
020226  006300                       ASL     R0
020230  006300                       ASL     R0
020232  062700  001256               ADD     #$ERRTB,R0      ;;FORM TABLE POINTER
020236  012037  020246               MOV     (R0)+,2$        ;;PICKUP "ERROR MESSAGE" POINTER
020242  001404                       BEQ     3$              ;;SKIP TYPEOUT IF NO POINTER
020244  104401                       TYPE                    ;;TYPE THE "ERROR MESSAGE"
020246  000000                2$:    .WORD   0               ;;"ERROR MESSAGE" POINTER GOES HERE
020250  104401  001167               TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
020254  012037  020264        3$:    MOV     @(R0)+,4$       ;;PICKUP "DATA HEADER" POINTER
020260  001404                       BEQ     5$              ;;SKIP TYPEOUT IF 0
020262  104401                       TYPE                    ;;TYPE THE "DATA HEADER"
020264  000000                4$:    .WORD   0               ;;"DATA HEADER" POINTER GOES HERE
020266  104401  001167               TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
020272  011000                5$:    MOV     (R0),R0         ;;PICKUP "DATA TABLE" POINTER
020274  001004                       BNE     7$              ;;GO TYPE THE DATA
020276  012600                6$:    MOV     (SP)+,R0        ;;RESTORE R0
020300  104401  001167               TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
020304  000207                       RTS     PC              ;;RETURN
020306                          7$:
020306  013046                       MOV     @(R0)+,-(SP)    ;;SAVE @(R0)+ FOR TYPEOUT
020310  104402                       TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
020312  005710                       TST     (R0)            ;;IS THERE ANOTHER NUMBER?
020314  001770                       BEQ     6$              ;;BR IF NO
020316  104401  020324               TYPE    ,8$             ;;TYPE TWO(2) SPACES
020322  000771                       BR      7$              ;;LOOP
020324  020040  000         8$:    .ASCIZ  /  /            ;;TWO(2) SPACES
020330                               .EVEN
```

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

                                ;;**********************************************************************
                                ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
                                ;*OCTAL (ASCII) NUMBER AND TYPE IT.
                                ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
                                ;*CALL:
                                ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                ;*      TYPOS                   ;;CALL FOR TYPEOUT
                                ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
                                ;*      .BYTE   M               ;;M=1 OR 0
                                ;*                                      ;;1=TYPE LEADING ZEROS
                                ;*                                      ;;0=SUPPRESS LEADING ZEROS
                                ;*
                                ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
                                ;*$TYPOS OR $TYPOC
                                ;*CALL:
                                ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                ;*      TYPON                   ;;CALL FOR TYPEOUT
                                ;*
                                ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
                                ;*CALL:
                                ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                ;*      TYPOC                   ;;CALL FOR TYPEOUT

020330  017646  000000          $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
020334  116637  000001  020553          MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
020342  112637  020555          MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
020346  062716  000002          ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
020352  000406                  BR      $TYPON
020354  112737  000001  020553  $TYPOC: MOVB    #1,$OFILL       ;;SET THE ZERO FILL SWITCH
020362  112737  000006  020555          MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
020370  112737  000005  020552  $TYPON: MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
020376  010346                  MOV     R3,-(SP)        ;;SAVE R3
020400  010446                  MOV     R4,-(SP)        ;;SAVE R4
020402  010546                  MOV     R5,-(SP)        ;;SAVE R5
020404  113704  020555          MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
020410  005404                  NEG     R4
020412  062704  000006          ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
020416  110437  020554          MOVB    R4,$OMODE       ;;SAVE IT FOR USE
020422  113704  020553          MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
020426  016605  000012          MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
020432  005003                  CLR     R3              ;;CLEAR THE OUTPUT WORD
020434  006105          1$:     ROL     R5              ;;ROTATE MSB INTO "C"
020436  000404                  BR      3$              ;;GO DO MSB
020440  006105          2$:     ROL     R5              ;;FORM THIS DIGIT
020442  006105                  ROL     R5
020444  006105                  ROL     R5
020446  010503                  MOV     R5,R3
020450  006103          3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
020452  105337  020554          DECB    $OMODE          ;;TYPE THIS DIGIT?
020456  100016                  BPL     7$              ;;BR IF NO
020460  042703  177770          BIC     #177770,R3      ;;GET RID OF JUNK
020464  001002                  BNE     4$              ;;TEST FOR 0
020466  005704                  TST     R4              ;;SUPPRESS THIS 0?
```

```
                        BEQ     5$              ;;BR IF YES
                4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
                        BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
                5$:     BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
                        MOVB    R3,8$           ;;SAVE FOR TYPING
                        TYPE    ,8$             ;;GO TYPE THIS DIGIT
                7$:     DECB    $OCNT           ;;COUNT BY 1
                        BGT     2$              ;;BR IF MORE TO DO
                        BLT     6$              ;;BR IF DONE
                        INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
                        BR      2$              ;;GO DO THE LAST DIGIT
                6$:     MOV     (SP)+,R5        ;;RESTORE R5
                        MOV     (SP)+,R4        ;;RESTORE R4
                        MOV     (SP)+,R3        ;;RESTORE R3
                        MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
                        MOV     (SP)+,(SP)
                        RTI                     ;;RETURN
                8$:     .BYTE   0               ;;STORAGE FOR ASCII DIGIT
                        .BYTE   0               ;;TERMINATOR FOR TYPE ROUTINE
                $OCNT:  .BYTE   0               ;;OCTAL DIGIT COUNTER
                $OFILL: .BYTE   0               ;;ZERO FILL SWITCH
                $OMODE: .WORD   0               ;;NUMBER OF DIGITS TO TYPE
                .SBTTL  CONVERT BINARY TO DECIMAL AND TYPE ROUTINE

                ;;**********************************************************
                ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 5-DIGIT
                ;*SIGNED DECIMAL (ASCII) NUMBER AND TYPE IT. DEPENDING ON WHETHER THE
                ;*NUMBER IS POSITIVE OR NEGATIVE A SPACE OR A MINUS SIGN WILL BE TYPED
                ;*BEFORE THE FIRST DIGIT OF THE NUMBER. LEADING ZEROS WILL ALWAYS BE
                ;*REPLACED WITH SPACES.
                ;*CALL:
                ;*      MOV     NUM,-(SP)       ;;PUT THE BINARY NUMBER ON THE STACK
                ;*      TYPDS                   ;;GO TO THE ROUTINE

                $TYPDS:
                        MOV     R0,-(SP)        ;;PUSH R0 ON STACK
                        MOV     R1,-(SP)        ;;PUSH R1 ON STACK
                        MOV     R2,-(SP)        ;;PUSH R2 ON STACK
                        MOV     R3,-(SP)        ;;PUSH R3 ON STACK
                        MOV     R5,-(SP)        ;;PUSH R5 ON STACK
                        MOV     #20200,-(SP)    ;;SET BLANK SWITCH AND SIGN
                        MOV     20(SP),R5       ;;GET THE INPUT NUMBER
                        BPL     1$              ;;BR IF INPUT IS POS.
                        NEG     R5              ;;MAKE THE BINARY NUMBER POS.
                        MOVB    #'-,1(SP)       ;;MAKE THE ASCII NUMBER NEG.
                1$:     CLR     R0              ;;ZERO THE CONSTANTS INDEX
                        MOV     #$DBLK,R3       ;;SETUP THE OUTPUT POINTER
                        MOVB    #' ,(R3)+       ;;SET THE FIRST CHARACTER TO A BLANK
                2$:     CLR     R2              ;;CLEAR THE BCD NUMBER
                        MOV     $DTBL(R0),R1    ;;GET THE CONSTANT
                3$:     SUB     R1,R5           ;;FORM THIS BCD DIGIT
                        BLT     4$              ;;BR IF DONE
                        INC     R2              ;;INCREASE THE BCD DIGIT BY 1
                        BR      3$
                4$:     ADD     R1,R5           ;;ADD BACK THE CONSTANT
                        TST     R2              ;;CHECK IF BCD DIGIT=0
```

```
3121  020646  001002                        BNE     5$                ;;FALL THROUGH IF 0
3122  020650  105716                        TSTB    (SP)              ;;STILL DOING LEADING 0'S?
3123  020652  100407                        BMI     7$                ;;BR IF YES
3124  020654  106316                5$:     ASLB    (SP)              ;;MSD?
3125  020656  103003                        BCC     6$                ;;BR IF NO
3126  020660  116663  000001  177777        MOVB    1(SP),-1(R3)      ;;YES--SET THE SIGN
3127  020666  052702  000060        6$:     BIS     #'0,R2            ;;MAKE THE BCD DIGIT ASCII
3128  020672  052702  000040        7$:     BIS     #' ,R2            ;;MAKE IT A SPACE IF NOT ALREADY A DIGIT
3129  020676  110223                        MOVB    R2,(R3)+          ;;PUT THIS CHARACTER IN THE OUTPUT BUFFER
3130  020700  005720                        TST     (R0)+             ;;JUST INCREMENTING
3131  020702  020027  000010                CMP     R0,#10            ;;CHECK THE TABLE INDEX
3132  020706  002746                        BLT     2$                ;;GO DO THE NEXT DIGIT
3133  020710  003002                        BGT     8$                ;;GO TO EXIT
3134  020712  010502                        MOV     R5,R2             ;;GET THE LSD
3135  020714  000764                        BR      6$                ;;GO CHANGE TO ASCII
3136  020716  105726                8$:     TSTB    (SP)+             ;;WAS THE LSD THE FIRST NON-ZERO?
3137  020720  100003                        BPL     9$                ;;BR IF NO
3138  020722  116663  177777  177776        MOVB    -1(SP),-2(R3)     ;;YES--SET THE SIGN FOR TYPING
3139  020730  105013                9$:     CLRB    (R3)              ;;SET THE TERMINATOR
3140  020732  012605                        MOV     (SP)+,R5          ;;POP STACK INTO R5
3141  020734  012603                        MOV     (SP)+,R3          ;;POP STACK INTO R3
3142  020736  012602                        MOV     (SP)+,R2          ;;POP STACK INTO R2
3143  020740  012601                        MOV     (SP)+,R1          ;;POP STACK INTO R1
3144  020742  012600                        MOV     (SP)+,R0          ;;POP STACK INTO R0
3145  020744  104401  020772                TYPE    ,$DBLK            ;;NOW TYPE THE NUMBER
3146  020750  016666  000002  000004        MOV     2(SP),4(SP)       ;;ADJUST THE STACK
3147  020756  012616                        MOV     (SP)+,(SP)
3148  020760  000002                        RTI                       ;;RETURN TO USER
3149  020762  023420                $DTBL:  10000.
3150  020764  001750                        1000.
3151  020766  000144                        100.
3152  020770  000012                        10.
3153  020772  000004                $DBLK:  .BLKW   4
```

```
                                        .SBTTL  POWER DOWN AND UP ROUTINES

                                        ;;**********************************************************************
                                        ;POWER DOWN ROUTINE
021002  012737  021146  000024  $PWRDN: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST UP
021010  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;PRIO:7
021016  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
021020  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
021022  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
021024  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
021026  010446                          MOV     R4,-(SP)        ;;PUSH R4 ON STACK
021030  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
021032  017746  160102                  MOV     @SWR,-(SP)      ;;PUSH @SWR ON STACK
021036  010637  021152                  MOV     SP,$SAVR6       ;;SAVE SP
021042  012737  021054  000024          MOV     #$PWRUP,@#PWRVEC ;;SET UP VECTOR
021050  000000                          HALT
021052  000776                          BR      .-2             ;;HANG UP

                                        ;;**********************************************************************
                                        ;POWER UP ROUTINE
021054  012737  021146  000024  $PWRUP: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST DOWN
021062  013706  021152                  MOV     $SAVR6,SP       ;;GET SP
021066  005037  021152                  CLR     $SAVR6          ;;WAIT LOOP FOR THE TTY
021072  005237  021152          1$:     INC     $SAVR6          ;;WAIT FOR THE INC
021076  001375                          BNE     1$              ;;OF  WORD
021100  012677  160034                  MOV     (SP)+,@SWR      ;;POP STACK INTO @SWR
021104  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
021106  012604                          MOV     (SP)+,R4        ;;POP STACK INTO R4
021110  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
021112  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
021114  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
021116  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
021120  012737  021002  000024          MOV     #$PWRDN,@#PWRVEC ;;SET UP THE POWER DOWN VECTOR
021126  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;PRIO:7
021134  104401                          TYPE                    ;;REPORT THE POWER FAILURE
021136  021154                  $PWRMG: .WORD   PWRMSG          ;;POWER FAIL MESSAGE POINTER
021140  012716                          MOV     (PC)+,(SP)      ;;RESTART AT BEGIN
021142  001572                  $PWRAD: .WORD   BEGIN           ;;RESTART ADDRESS
021144  000002                          RTI
021146  000000                  $ILLUP: HALT                    ;;THE POWER UP SEQUENCE WAS STARTED
021150  000776                          BR      .-2             ;; BEFORE THE POWER DOWN WAS COMPLETE
021152  000000                  $SAVR6: 0                       ;;PUT THE SP HERE
021154  005015  042522  052123  PWRMSG: .ASCIZ  <15><12>/RESTARTING AFTER A POWER FAILURE/<15><12>
021162  051101  044524  043516
021170  040440  052106  051105
021176  040440  050040  053517
021204  051105  043040  044501
021212  052514  042522  005015
021220      000
021222                          .EVEN
```

```
                                .SBTTL  TYPE ROUTINE

                                ;;**********************************************************************
                                ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
                                ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
                                ;*NOTE1:         $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
                                ;*NOTE2:         $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
                                ;*NOTE3:         $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
                                ;*
                                ;*CALL:
                                ;*1) USING A TRAP INSTRUCTION
                                ;*      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
                                ;*OR
                                ;*      TYPE
                                ;*      MESADR
                                ;*

021222  105737  001157          $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
021226  100002                          BPL     1$              ;;BR IF YES
021230  000000                          HALT                    ;;HALT HERE IF NO TERMINAL
021232  000430                          BR      3$              ;;LEAVE
021234  010046                  1$:     MOV     R0,-(SP)        ;;SAVE R0
021236  017600  000002                  MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
021242  122737  000001  001212          CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
021250  001011                          BNE     62$             ;;NO,GO CHECK FOR APT CONSOLE
021252  132737  000100  001213          BITB    #APTSPOOL,$ENVM ;;SPOOL MESSAGE TO APT
021260  001405                          BEQ     62$             ;;NO,GO CHECK FOR CONSOLE
021262  010037  021272                  MOV     R0,61$          ;;SETUP MESSAGE ADDRESS FOR APT
021266  004737  021512                  JSR     PC,$ATY3        ;;SPOOL MESSAGE TO APT
021272  000000                  61$:    .WORD   0               ;;MESSAGE ADDRESS
021274  132737  000040  001213  62$:    BITB    #APTCSUP,$ENVM  ;;APT CONSOLE SUPPRESSED
021302  001003                          BNE     60$             ;;YES,SKIP TYPE OUT
021304  112046                  2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
021306  001005                          BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
021310  005726                          TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
021312  012600                  60$:    MOV     (SP)+,R0        ;;RESTORE R0
021314  062716  000002          3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
021320  000002                          RTI                     ;;RETURN
021322  122716  000011          4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
021326  001430                          BEQ     8$
021330  122716  000200                  CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
021334  001006                          BNE     5$
021336  005726                          TST     (SP)+           ;;POP  <CR><LF> EQUIV
021340  104401                          TYPE                    ;;TYPE A CR AND LF
021342  001167                          $CRLF
021344  105037  021500                  CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
021350  000755                          BR      2$              ;;GET NEXT CHARACTER
021352  004737  021434          5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
021356  123726  001156          6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
021362  001350                          BNE     2$              ;;IF NO GO GET NEXT CHAR.
021364  013746  001154                  MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
                                                                ;;AND THE NULL CHAR.
021370  105366  000001          7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
021374  002770                          BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
021376  004737  021434                  JSR     PC,$TYPEC       ;;GO TYPE A NULL
021402  105337  021500                  DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
```

```
3261  021406  000770                        BR      7$              ;;LOOP
3262
3263                                  ;HORIZONTAL TAB PROCESSOR
3264
3265  021410  112716  000040          9$:     MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
3266  021414  004737  021434          9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
3267  021420  132737  000007  021500          BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
3268  021426  001372                          BNE     9$              ;;TAB STOP
3269  021430  005726                          TST     (SP)+           ;;POP SPACE OFF STACK
3270  021432  000724                          BR      2$              ;;GET NEXT CHARACTER
3271  021434  105777  157510          $TYPEC: TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
3272  021440  100375                          BPL     $TYPEC
3273  021442  116677  000002  157502        MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
3274  021450  122766  000015  000002        CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
3275  021456  001003                          BNE     1$              ;;BRANCH IF NO
3276  021460  105037  021500                CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
3277  021464  000406                          BR      $TYPEX          ;;EXIT
3278  021466  122766  000012  000002  1$:     CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
3279  021474  001402                          BEQ     $TYPEX          ;;BRANCH IF YES
3280  021476  105227                          INCB    (PC)+           ;;COUNT THE CHARACTER
3281  021500  000000          $CHARCNT:.WORD  0               ;;CHARACTER COUNT STORAGE
3282  021502  000207          $TYPEX: RTS     PC
3283
3284                                  .SBTTL  APT COMMUNICATIONS ROUTINE
3285
3286                                  ;;**************************************************************
3287  021504  112737  000001  021750  $ATY1:  MOVB    #1,$FFLG        ;;TO REPORT FATAL ERROR
3288  021512  112737  000001  021746  $ATY3:  MOVB    #1,$MFLG        ;;TO TYPE A MESSAGE
3289  021520  000403                          BR      $ATYC
3290  021522  112737  000001  021750  $ATY4:  MOVB    #1,$FFLG        ;;TO ONLY REPORT FATAL ERROR
3291  021530          $ATYC:
3292  021530  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
3293  021532  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
3294  021534  105737  021746                TSTB    $MFLG           ;;SHOULD TYPE A MESSAGE?
3295  021540  001450                          BEQ     5$              ;;IF NOT:  BR
3296  021542  122737  000001  001212        CMPB    #APTENV,$ENV    ;;OPERATING UNDER APT?
3297  021550  001031                          BNE     3$              ;;IF NOT:  BR
3298  021552  132737  000100  001213        BITB    #APTSPOOL,$ENVM ;;SHOULD SPOOL MESSAGES?
3299  021560  001425                          BEQ     3$              ;;IF NOT:  BR
3300  021562  017600  000004                MOV     @4(SP),R0       ;;GET MESSAGE ADDR.
3301  021566  062766  000002  000004        ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
3302  021574  005737  001172          1$:     TST     $MSGTYPE        ;;SEE IF DONE W/ LAST XMISSION?
3303  021600  001375                          BNE     1$              ;;IF NOT:  WAIT
3304  021602  010037  001206                MOV     R0,$MSGAD       ;;PUT ADDR IN MAILBOX
3305  021606  105720                  2$:     TSTB    (R0)+           ;;FIND END OF MESSAGE
3306  021610  001376                          BNE     2$
3307  021612  163700  001206                SUB     $MSGAD,R0       ;;SUB START OF MESSAGE
3308  021616  006200                          ASR     R0              ;;GET MESSAGE LNGTH IN WORDS
3309  021620  010037  001210                MOV     R0,$MSGLGT      ;;PUT LENGTH IN MAILBOX
3310  021624  012737  000004  001172        MOV     #4,$MSGTYPE     ;;TELL APT TO TAKE MSG.
3311  021632  000413                          BR      5$
3312  021634  017637  000004  021660  3$:     MOV     @4(SP),4$       ;;PUT MSG ADDR IN JSR LINKAGE
3313  021642  062766  000002  000004        ADD     #2,4(SP)                ;;BUMP RETURN ADDRESS
3314  021650  013746  177776                MOV     177776,-(SP)    ;;PUSH 177776 ON STACK
3315  021654  004737  021222                JSR     PC,$TYPE        ;;CALL TYPE MACRO
3316  021660  000000          4$:     .WORD   0
```

```
3317  021662                          5$:
3318  021662  105737  021750          10$:    TSTB    $FFLG           ;;SHOULD REPORT FATAL ERROR?
3319  021666  001416                          BEQ     12$             ;;IF NOT:  BR
3320  021670  005737  001212                  TST     $ENV            ;;RUNNING UNDER APT?
3321  021674  001413                          BEQ     12$             ;;IF NOT:  BR
3322  021676  005737  001172          11$:    TST     $MSGTYPE        ;;FINISHED LAST MESSAGE?
3323  021702  001375                          BNE     11$             ;;IF NOT:  WAIT
3324  021704  017637  000004  001174          MOV     @4(SP),$FATAL   ;;GET ERROR #
3325  021712  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
3326  021720  005237  001172                  INC     $MSGTYPE        ;;TELL APT TO TAKE ERROR
3327  021724  105037  021750          12$:    CLRB    $FFLG           ;;CLEAR FATAL FLAG
3328  021730  105037  021747                  CLRB    $LFLG           ;;CLEAR LOG FLAG
3329  021734  105037  021746                  CLRB    $MFLG           ;;CLEAR MESSAGE FLAG
3330  021740  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
3331  021742  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
3332  021744  000207                          RTS     PC              ;;RETURN
3333  021746     000  $MFLG:   .BYTE   0      ;;MESSG. FLAG
3334  021747     000  $LFLG:   .BYTE   0      ;;LOG FLAG
3335  021750     000  $FFLG:   .BYTE   0      ;;FATAL FLAG
3336          021752          .EVEN
3337          000200  APTSIZE=200
3338          000001  APTENV=001
3339          000100  APTSPOOL=100
3340          000040  APTCSUP=040
```

```
                                .SBTTL  TTY INPUT ROUTINE
                                ;;**********************************************************************
                                .ENABL  LSB
                                ;;**********************************************************************
                                ;*SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
                                ;*ROUTINE IS ENTERED FROM THE TRAP HANDLER, AND WILL
                                ;*SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP CALL
                                ;*WHEN OPERATING IN TTY FLAG MODE.
021752  022737  000176  001140  $CKSWR: CMP     #SWREG,SWR      ;;IS THE SOFT-SWR SELECTED?
021760  001074                         BNE     15$             ;;BRANCH IF NO
021762  105777  157156                 TSTB    @$TKS           ;;CHAR THERE?
021766  100071                         BPL     15$             ;;IF NO, DON'T WAIT AROUND
021770  117746  157152                 MOVB    @$TKB,-(SP)     ;;SAVE THE CHAR
021774  042716  177600                 BIC     #^C177,(SP)     ;;STRIP-OFF THE ASCII
022000  022726  000007                 CMP     #7,(SP)+        ;;IS IT A CONTROL G?
022004  001062                         BNE     15$             ;;NO, RETURN TO USER
022006  123727  001134  000001         CMPB    $AUTOB,#1       ;;ARE WE RUNNING IN AUTO-MODE?
022014  001456                         BEQ     15$             ;;BRANCH IF YES
                                
022016  104401  022477                 TYPE    ,$CNTLG         ;;ECHO THE CONTROL-G (^G)
022022  104401  022504         $GTSWR: TYPE    ,$MSWR          ;;TYPE CURRENT CONTENTS
022026  013746  000176                 MOV     $SWREG,-(SP)    ;;SAVE SWREG FOR TYPEOUT
022032  104402                         TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
022034  104401  022515                 TYPE    ,$MNEW          ;;PROMPT FOR NEW SWR
022040  005046                 19$:    CLR     -(SP)           ;;CLEAR COUNTER
022042  005046                         CLR     -(SP)           ;;THE NEW SWR
022044  105777  157074         7$:     TSTB    @$TKS           ;;CHAR THERE?
022050  100375                         BPL     7$              ;;IF NOT TRY AGAIN
                                
022052  117746  157070                 MOVB    @$TKB,-(SP)     ;;PICK UP CHAR
022056  042716  177600                 BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
                                
                                
                                
022062  021627  000025         9$:     CMP     (SP),#25        ;;IS IT A CONTROL-U?
022066  001005                         BNE     10$             ;;BRANCH IF NOT
022070  104401  022472                 TYPE    ,$CNTLU         ;;YES, ECHO CONTROL-U (^U)
022074  062706  000006         20$:    ADD     #6,SP           ;;IGNORE PREVIOUS INPUT
022100  000757                         BR      19$             ;;LET'S TRY IT AGAIN
                                
                                
022102  021627  000015         10$:    CMP     (SP),#15        ;;IS IT A <CR>?
022106  001022                         BNE     16$             ;;BRANCH IF NO
022110  005766  000004                 TST     4(SP)           ;;YES, IS IT THE FIRST CHAR?
022114  001403                         BEQ     11$             ;;BRANCH IF YES
022116  016677  000002  157014         MOV     2(SP),@SWR      ;;SAVE NEW SWR
022124  062706  000006         11$:    ADD     #6,SP           ;;CLEAR UP STACK
022130  104401  001167         14$:    TYPE    ,$CRLF          ;;ECHO <CR> AND <LF>
022134  123727  001135  000001         CMPB    $INTAG,#1       ;;RE-ENABLE TTY KBD INTERRUPTS?
022142  001003                         BNE     15$             ;;BRANCH IF NOT
022144  012777  000100  156772         MOV     #100,@$TKS      ;;RE-ENABLE TTY KBD INTERRUPTS
022152  000002                 15$:    RTI                     ;;RETURN
022154  004737  021434         16$:    JSR     PC,$TYPEC       ;;ECHO CHAR
022160  021627  000060                 CMP     (SP),#60        ;;CHAR < 0?
```

```
3397  022164  002420                          BLT     18$             ;;BRANCH IF YES
3398  022166  021627  000067                  CMP     (SP),#67        ;;CHAR > 7?
3399  022172  003015                          BGT     18$             ;;BRANCH IF YES
3400  022174  042726  000060                  BIC     #60,(SP)+       ;;STRIP-OFF ASCII
3401  022200  005766  000002                  TST     2(SP)           ;;IS THIS THE FIRST CHAR
3402  022204  001403                          BEQ     17$             ;;BRANCH IF YES
3403  022206  006316                          ASL     (SP)            ;;NO, SHIFT PRESENT
3404  022210  006316                          ASL     (SP)            ;;   CHAR OVER TO MAKE
3405  022212  006316                          ASL     (SP)            ;;   ROOM FOR NEW ONE.
3406  022214  005266  000002          17$:    INC     2(SP)           ;;KEEP COUNT OF CHAR
3407  022220  056616  177776                  BIS     -2(SP),(SP)     ;;SET IN NEW CHAR
3408  022224  000707                          BR      7$              ;;GET THE NEXT ONE
3409  022226  104401  001166          18$:    TYPE    ,$QUES          ;;TYPE ?<CR><LF>
3410  022232  000720                          BR      20$             ;;SIMULATE CONTROL-U
3411                                .DSABL  LSB
3412
3413
3414                                ;;**********************************************************************
3415                                ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
3416                                ;*CALL:
3417                                ;*      RDCHR                   ;;INPUT A SINGLE CHARACTER FROM THE TTY
3418                                ;*      RETURN HERE             ;;CHARACTER IS ON THE STACK
3419                                ;*                              ;;WITH PARITY BIT STRIPPED OFF
3420                                ;
3421
3422  022234  011646                $RDCHR: MOV     (SP),-(SP)      ;;PUSH DOWN THE PC
3423  022236  016666  000004  000002        MOV     4(SP),2(SP)     ;;SAVE THE PS
3424  022244  105777  156674          1$:    TSTB    @$TKS           ;;WAIT FOR
3425  022250  100375                        BPL     1$              ;;A CHARACTER
3426  022252  117766  156670  000004        MOVB    @$TKB,4(SP)     ;;READ THE TTY
3427  022260  042766  177600  000004        BIC     #^C<177>,4(SP)  ;;GET RID OF JUNK IF ANY
3428  022266  026627  000004  000023        CMP     4(SP),#23       ;;IS IT A CONTROL-S?
3429  022274  001013                        BNE     3$              ;;BRANCH IF NO
3430  022276  105777  156642          2$:    TSTB    @$TKS           ;;WAIT FOR A CHARACTER
3431  022302  100375                        BPL     2$              ;;LOOP UNTIL ITS THERE
3432  022304  117746  156636                MOVB    @$TKB,-(SP)     ;;GET CHARACTER
3433  022310  042716  177600                BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
3434  022314  022627  000021                CMP     (SP)+,#21       ;;IS IT A CONTROL-Q?
3435  022320  001366                        BNE     2$              ;;IF NOT DISCARD IT
3436  022322  000750                        BR      1$              ;;YES, RESUME
3437  022324  026627  000004  000140  3$:    CMP     4(SP),#140      ;;IS IT UPPER CASE?
3438  022332  002407                        BLT     4$              ;;BRANCH IF YES
3439  022334  026627  000004  000175        CMP     4(SP),#175      ;;IS IT A SPECIAL CHAR?
3440  022342  003003                        BGT     4$              ;;BRANCH IF YES
3441  022344  042766  000040  000004        BIC     #40,4(SP)       ;;MAKE IT UPPER CASE
3442  022352  000002                  4$:    RTI                     ;;GO BACK TO USER
3443                                ;;**********************************************************************
3444                                ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
3445                                ;*CALL:
3446                                ;*      RDLIN                   ;;INPUT A STRING FROM THE TTY
3447                                ;*      RETURN HERE             ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
3448                                ;*                              ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
3449
3450  022354  010346                $RDLIN: MOV     R3,-(SP)        ;;SAVE R3
3451  022356  012703  022462          1$:    MOV     #$TTYIN,R3      ;;GET ADDRESS
3452  022362  022703  022472          2$:    CMP     #$TTYIN+8.,R3   ;;BUFFER FULL?
```

```
3453  022366  101405                          BLOS    4$              ;;BR IF YES
3454  022370  104410                          RDCHR                   ;;GO READ ONE CHARACTER FROM THE TTY
3455  022372  112613                          MOVB    (SP)+,(R3)      ;;GET CHARACTER
3456  022374  122713  000177          10$:    CMPB    #177,(R3)       ;;IS IT A RUBOUT
3457  022400  001003                          BNE     3$              ;;SKIP IF NOT
3458  022402  104401  001166          4$:     TYPE    ,$QUES          ;;TYPE A '?'
3459  022406  000763                          BR      1$              ;;CLEAR THE BUFFER AND LOOP
3460  022410  111337  022460          3$:     MOVB    (R3),9$         ;;ECHO THE CHARACTER
3461  022414  104401  022460                  TYPE    ,9$
3462  022420  122723  000015                  CMPB    #15,(R3)+       ;;CHECK FOR RETURN
3463  022424  001356                          BNE     2$              ;;LOOP IF NOT RETURN
3464  022426  105063  177777                  CLRB    -1(R3)          ;;CLEAR RETURN (THE 15)
3465  022432  104401  001170                  TYPE    ,$LF            ;;TYPE A LINE FEED
3466  022436  012603                          MOV     (SP)+,R3        ;;RESTORE R3
3467  022440  011646                          MOV     (SP),-(SP)      ;;ADJUST THE STACK AND PUT ADDRESS OF THE
3468  022442  016666  000004  000002          MOV     4(SP),2(SP)     ;;      FIRST ASCII CHARACTER ON IT
3469  022450  012766  022462  000004          MOV     #$TTYIN,4(SP)
3470  022456  000002                          RTI                     ;;RETURN
3471  022460     000                  9$:     .BYTE   0               ;;STORAGE FOR ASCII CHAR. TO TYPE
3472  022461     000                          .BYTE   0               ;;TERMINATOR
3473  022462  000010                  $TTYIN: .BLKB   8.              ;;RESERVE 8 BYTES FOR TTY INPUT
3474  022472  052536  005015     000  $CNTLU: .ASCIZ  /↑U/<15><12>    ;;CONTROL "U"
3475  022477     136  006507  000012  $CNTLG: .ASCIZ  /↑G/<15><12>    ;;CONTROL "G"
3476  022504  005015  053523  020122  $MSWR:  .ASCIZ  <15><12>/SWR = /
3477  022512  020075     000
3478  022515     040  047040  053505  $MNEW:  .ASCIZ  /  NEW = /
3479  022522  036440  000040
3480                                  .SBTTL  READ AN OCTAL NUMBER FROM THE TTY
3481
3482                                  ;;**************************************************************
3483                                  ;*THIS ROUTINE WILL READ AN OCTAL (ASCII) NUMBER FROM THE TTY AND
3484                                  ;*CHANGE IT TO BINARY.
3485                                  ;*CALL:
3486                                  ;*      RDOCT                   ;;READ AN OCTAL NUMBER
3487                                  ;*      RETURN HERE             ;;LOW ORDER BITS ARE ON TOP OF THE STACK
3488                                  ;*                              ;;HIGH ORDER BITS ARE IN $HIOCT
3489
3490  022526  011646                  $RDOCT: MOV     (SP),-(SP)      ;;PROVIDE SPACE FOR THE
3491  022530  016666  000004  000002          MOV     4(SP),2(SP)     ;;INPUT NUMBER
3492  022536  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
3493  022540  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
3494  022542  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
3495  022544  104411                  1$:     RDLIN                   ;;READ AN ASCIZ LINE
3496  022546  012600                          MOV     (SP)+,R0        ;;GET ADDRESS OF 1ST CHARACTER
3497  022550  005001                          CLR     R1              ;;CLEAR DATA WORD
3498  022552  005002                          CLR     R2
3499  022554  112046                  2$:     MOVB    (R0)+,-(SP)     ;;PICKUP THIS CHARACTER
3500  022556  001412                          BEQ     3$              ;;IF ZERO GET OUT
3501  022560  006301                          ASL     R1              ;;*2
3502  022562  006102                          ROL     R2
3503  022564  006301                          ASL     R1              ;;*4
3504  022566  006102                          ROL     R2
3505  022570  006301                          ASL     R1              ;;*8
3506  022572  006102                          ROL     R2
3507  022574  042716  177770                  BIC     #↑C7,(SP)       ;;STRIP THE ASCII JUNK
3508  022600  062601                          ADD     (SP)+,R1        ;;ADD IN THIS DIGIT
```

```
 3509  022602  000764                    BR      2$              ;;LOOP
 3510  022604  005726              3$:   TST     (SP)+           ;;CLEAN TERMINATOR FROM STACK
 3511  022606  010166  000012            MOV     R1,12(SP)       ;;SAVE THE RESULT
 3512  022612  010237  022626            MOV     R2,$HIOCT
 3513  022616  012602                    MOV     (SP)+,R2        ;;POP STACK INTO R2
 3514  022620  012601                    MOV     (SP)+,R1        ;;POP STACK INTO R1
 3515  022622  012600                    MOV     (SP)+,R0        ;;POP STACK INTO R0
 3516  022624  000002                    RTI                     ;;RETURN
 3517  022626  000000              $HIOCT: .WORD   0               ;;HIGH ORDER BITS GO HERE
```

```
                                .SBTTL  TRAP DECODER

                                ;;**************************************************************
                                ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
                                ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
                                ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
                                ;*GO TO THAT ROUTINE.

022630  010046          $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
022632  016600  000002          MOV     2(SP),R0        ;;GET TRAP ADDRESS
022636  005740                  TST     -(R0)           ;;BACKUP BY 2
022640  111000                  MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
022642  006300                  ASL     R0              ;;POSITION FOR INDEXING
022644  016000  022664          MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
022650  000200                  RTS     R0              ;;GO TO ROUTINE


                                ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO

022652  011646          $TRAP2: MOV     (SP),-(SP)      ;;MOVE THE PC DOWN
022654  016666  000004  000002          MOV     4(SP),2(SP)     ;;MOVE THE PSW DOWN
022662  000002                  RTI                     ;;RESTORE THE PSW

                                .SBTTL  TRAP TABLE

                                ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
                                ;*BY THE "TRAP" INSTRUCTION.

                                ;       ROUTINE
                                ;       -------
022664  022652          $TRPAD: .WORD   $TRAP2
022666  021222                  $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
022670  020354                  $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
022672  020330                  $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
022674  020370                  $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
022676  020556                  $TYPDS  ;;CALL=TYPDS    TRAP+5(104405)  TYPE DECIMAL NUMBER (WITH SIGN)

022700  022022                  $GTSWR  ;;CALL=GTSWR    TRAP+6(104406)  GET SOFT-SWR SETTING

022702  021752                  $CKSWR  ;;CALL=CKSWR    TRAP+7(104407)  TEST FOR CHANGE IN SOFT-SWR
022704  022234                  $RDCHR  ;;CALL=RDCHR    TRAP+10(104410) TTY TYPEIN CHARACTER ROUTINE
022706  022354                  $RDLIN  ;;CALL=RDLIN    TRAP+11(104411) TTY TYPEIN STRING ROUTINE
022710  022526                  $RDOCT  ;;CALL=RDOCT    TRAP+12(104412) READ AN OCTAL NUMBER FROM TTY
```

```
                                        .SBTTL  ASCII MESSAGES
022712  005015  046412  026504  TITLE:  .ASCIZ  <15><12><12>/MD-11-DZVSE-A0     AUG. 1976/<15><12>
022720  030461  042055  053132
022726  042523  040455  004460
022734  052501  027107  030440
022742  033471  006466  000012
022750     015     012          VTHDR1: .BYTE   15,12
022752  052126  030126  020061          .ASCIZ  /VTVO1 AT ADDRESS /
022760  052101  040440  042104
022766  042522  051523  000040
022774  044040  051501  000040  VTHDR2: .ASCIZ  / HAS /
023002  041040  052111  046440  VTHDR3: .ASCIZ  / BIT MAP(S) INSTALLED/<15><12>
023010  050101  051450  020051
023016  047111  052123  046101
023024  042514  006504  000012
023032  047516  041040  051525  EM1:    .ASCIZ  /NO BUS RESPONSE FROM A CHARACTER BUS REGISTER  ** FATAL ERROR **/
023040  051040  051505  047520
023046  051516  020105  051106
023054  046517  040440  041440
023062  040510  040522  052103
023070  051105  041040  051525
023076  051040  043505  051511
023104  042524  020122  025040
023112  020052  040506  040524
023120  020114  051105  047522
023126  020122  025052     000
023133     116  020117  052502  EM2:    .ASCIZ  /NO BUS RESPONSE FROM A SELECTED BIT MAP REGISTER/
023140  020123  042522  050123
023146  047117  042523  043040
023154  047522  020115  020101
023162  042523  042514  052103
023170  042105  041040  052111
023176  046440  050101  051040
023204  043505  051511  042524
023212  000122
023214  044103  051101  041501  EM3:    .ASCIZ  /CHARACTER STATUS REGISTER ERROR/
023222  042524  020122  052123
023230  052101  051525  051040
023236  043505  051511  042524
023244  020122  051105  047522
023252  000122
023254  042526  052122  041511  EM4:    .ASCIZ  /VERTICAL SYNC ERROR/
023262  046101  051440  047131
023270  020103  051105  047522
023276  000122
023300  042526  052122  041511  EM5:    .ASCIZ  /VERTICAL SYNC INTERRUPT ERROR/
023306  046101  051440  047131
023314  020103  047111  042524
023322  051122  050125  020124
023330  051105  047522  000122
023336  044502  020124  040515  EM6:    .ASCIZ  /BIT MAP STATUS REGISTER ERROR/
023344  020120  052123  052101
023352  051525  051040  043505
023360  051511  042524  020122
023366  051105  047522  000122
023374  044502  020124  040515  EM7:    .ASCIZ  /BIT MAP P.C. REGISTER ERROR/
```

```
3618  023402  020120  027120  027103
3619  023410  051040  043505  051511
3620  023416  042524  020122  051105
3621  023424  047522  000122
3622  023430  044502  020124  040515  EM10:   .ASCIZ  /BIT MAP P.C. INCREMENT ERROR/
3623  023436  020120  027120  027103
3624  023444  044440  041516  042522
3625  023452  042515  052116  042440
3626  023460  051122  051117     000
3627  023465     127  051117  020104  EM11:   .ASCIZ  /WORD TEST OF PIXEL BIT 0 ERROR/
3628  023472  042524  052123  047440
3629  023500  020106  044520  042530
3630  023506  020114  044502  020124
3631  023514  020060  051105  047522
3632  023522  000122
3633  023524  054502  042524  052040  EM12:   .ASCIZ  /BYTE TEST OF PIXEL BIT 0 ERROR/
3634  023532  051505  020124  043117
3635  023540  050040  054111  046105
3636  023546  041040  052111  030040
3637  023554  042440  051122  051117
3638  023562     000
3639  023563     103  040510  040522  EM13:   .ASCIZ  /CHARACTER READY ERROR/
3640  023570  052103  051105  051040
3641  023576  040505  054504  042440
3642  023604  051122  051117     000
3643  023611     102  052111  046440  EM14:   .ASCIZ  /BIT MAP READY ERROR/
3644  023616  050101  051040  040505
3645  023624  054504  042440  051122
3646  023632  051117     000
3647  023635     120  042522  044526  EM16:   .ASCIZ  /PREVIOUSLY EXISTING BIT MAP DOES NOT EXIST NOW/
3648  023642  052517  046123  020131
3649  023650  054105  051511  044524
3650  023656  043516  041040  052111
3651  023664  046440  050101  042040
3652  023672  042517  020123  047516
3653  023700  020124  054105  051511
3654  023706  020124  047516  000127
3655  023714  051120  053105  047511  EM17:   .ASCIZ  /PREVIOUSLY EXISTING VTV01 CONTROLLER DOES NOT EXIST NOW/
3656  023722  051525  054514  042440
3657  023730  044530  052123  047111
3658  023736  020107  052126  030126
3659  023744  020061  047503  052116
3660  023752  047522  046114  051105
3661  023760  042040  042517  020123
3662  023766  047516  020124  054105
3663  023774  051511  020124  047516
3664  024002  000127
3665  024004  051105  050122  004503  DH1:    .ASCIZ  /ERRPC  DEVICE ADDRESS THAT CAUSED A BUS TRAP/
3666  024012  042504  044526  042503
3667  024020  040440  042104  042522
3668  024026  051523  052040  040510
3669  024034  020124  040503  051525
3670  024042  042105  040440  041040
3671  024050  051525  052040  040522
3672  024056  000120
3673  024060  051105  050122  004503  DH3:    .ASCIZ  /ERRPC  VCCSR   GOOD    BAD/
```

```
3674  024066  041526  051503  004522
3675  024074  047507  042117  041011
3676  024102  042101     000
3677  024105     105  051122  041520  DH4:    .ASCIZ  /ERRPC  VCCSR   TIME1   TIME2/
3678  024112  053011  041503  051123
3679  024120  052011  046511  030505
3680  024126  052011  046511  031105
3681  024134     000
3682  024135     105  051122  041520  DH5:    .ASCIZ  /ERRPC  VCCSR/
3683  024142  053011  041503  051123
3684  024150     000
3685  024151     105  051122  041520  DH6:    .ASCIZ  /ERRPC  VGCSR   GOOD    BAD/
3686  024156  053011  041507  051123
3687  024164  043411  047517  004504
3688  024172  040502  000104
3689  024176  051105  050122  004503  DH15:   .ASCIZ  /ERRPC  VGCSR/
3690  024204  043526  051503  000122
3691  024212  051105  050122  004503  DH16:   .ASCIZ  /ERRPC  VTV01/
3692  024220  052126  030126  000061
3693                                  .EVEN
3694  024226  001116  001126  000000  DT1:    $ERRPC,$BDDAT,0
3695  024234  001116  001446  001124  DT3:    $ERRPC,VCCSR,$GDDAT,$BDDAT,0
3696  024242  001126  000000
3697  024246  001116  001446  001510  DT4:    $ERRPC,VCCSR,SAVE0,SAVE2,0
3698  024254  001514  000000
3699  024260  001116  001446  000000  DT5:    $ERRPC,VCCSR,0
3700  024266  001116  001460  001124  DT6:    $ERRPC,VGCSR,$GDDAT,$BDDAT,0
3701  024274  001126  000000
3702  024300  001116  001460  000000  DT15:   $ERRPC,VGCSR,0
3703  024306  001116  001120  000000  DT16:   $ERRPC,$GDADR,0,0,0,0
3704  024314  000000  000000  000000
3705  024322     000     000     000  DF0:    .BYTE   0,0,0,0,0,0
3706  024325     000     000     000
3707  024330  000000                   BUFFER: 0
3708          000001                   .END
```

```
ABASE = 172600          121#    234     275     393     394     395     396     397     398     399     400     401
ACDW1 = 000000          234     277
ACDW2 = 000000          234     278
ACPUOP= 000000          234     249
ADDW0 = 000000          234
ADDW1 = 000000          234
ADDW10= 000000          234
ADDW11= 000000          234
ADDW12= 000000          234
ADDW13= 000000          234
ADDW14= 000000          234
ADDW15= 000000          234
ADDW2 = 000000          234
ADDW3 = 000000          234
ADDW4 = 000000          234
ADDW5 = 000000          234
ADDW6 = 000000          234
ADDW7 = 000000          234
ADDW8 = 000000          234
ADDW9 = 000000          234
ADEVCT= 000000          234     240
ADEVM = 000003          124#    234     276     835
AENV  = 000000          234     245
AENVM = 000000          234     246
AFATAL= 000000          234     237
AMADR1= 000000          234     262
AMADR2= 000000          234     266
AMADR3= 000000          234     269
AMADR4= 000000          234     272
AMAMS1= 000000          234     256
AMAMS2= 000000          234     264
AMAMS3= 000000          234     267
AMAMS4= 000000          234     270
AMSGAD= 000000          234     242
AMSGLG= 000000          234     243
AMSGTY= 000000          234     236
AMTYP1= 000000          234     257
AMTYP2= 000000          234     265
AMTYP3= 000000          234     268
AMTYP4= 000000          234     271
APASS = 000000          234     239
APRIOR= 000200          123#    234     2692
APTCSU= 000040         3235    3340#
APTENV= 000001         2944    3228    3296    3338#
APTSIZ= 000200          478    3337#
APTSPO= 000100         3230    3298    3339#
ASWREG= 000000          234     247
ATESTN= 000000          234     238
AUNIT = 000000          234     241
AUSWR = 000000          234     248
AVECT1= 100360          122#    234     273     403     404
AVECT2= 000000          234     274
BEGIN   001572          147     441#    2448    3192
BIT0  = 000001          106#    795     1302    1401    1468    1547    2778
BIT00 = 000001           96#    106
BIT01 = 000002           95#    105
```

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BIT02 = 000004            94#   104
BIT03 = 000010            93#   103
BIT04 = 000020            92#   102
BIT05 = 000040            91#   101
BIT06 = 000100            90#   100
BIT07 = 000200            89#    99
BIT08 = 000400            88#    98  2906
BIT09 = 001000            87#    97
BIT1  = 000002           105#  2446
BIT10 = 002000            96#   841   894  1220  1289  1376  1415  1416  1428  1443  1592  1609  1629
                         1651  1673  1695  1728  1755  1782  1809  1835  1862  1889  1916  1942  1969
                         1996  2023  2049  2076  2103  2130  2155  2182  2208  2235  2251  2293  2311
                         2332
BIT11 = 004000            85#   853   894  1074  1364  1415  1416  1428  1443  2254  2297  2332  2351
                         2372  2393  2420  2443  2446  2485  2617  2618
BIT12 = 010000            84#   865   894  1057  1546  2239  2485  2618  2698  2786  2831  2834  2836
BIT13 = 020000            83#   880   887   894   976  1009  2700  2702  2835  2837  2939
BIT14 = 040000            82#   908  2496  2834  2836  2892
BIT15 = 100000            81#   503   508   513   542   547   552   571   576   581   600   605   610
                         629   634   639   908   947   960   961  1458  1468  1484  2589  2775  2778
                        2835  2837
BIT2  = 000004           104#
BIT3  = 000010           103#
BIT4  = 000020           102#  1537
BIT5  = 000040           101#
BIT6  = 000100           100#  1525  2586  2799
BIT7  = 000200            99#  1485  1538
BIT8  = 000400            98#  1326  1388  1415  1416  1428  1443  1592  1609  1636  1658  1680  1702
                         1728  1755  1782  1809  1835  1862  1889  1916  1942  1969  1996  2023  2049
                         2076  2103  2130  2155  2182  2208  2235  2251  2293  2311  2332  2351  2372
                         2393  2420  2443  2446  2613  2617
BIT9  = 001000            97#  1459  1466  1494  2593
BPTVEC= 000014           113#
BRIAN   017504           2814  2818#
BUFFER  024330           1172  1179*  1186  1202*  1224  1262  2533  2558  2570  2779*  3707#
BURN    001544            431#   439*   441*   531  1047  1573
BURNIN  001564            151    439#
BUSOUT  016416            152   2625#
BYTST   017572           2834#
CKSWR = 104407           1205  2486  2619  2703  2890  2891  2931  2954  3557#
CLRMAP  016234           1322  1586  1607  1628  1650  1672  1694  1715  1742  1769  1796  1822  1849
                         1876  1903  1929  1956  1983  2010  2036  2063  2090  2117  2143  2169  2195
                         2222  2249  2309  2329  2350  2371  2392  2413  2452  2586#  2611  2615
CNTSAV  015766           2495*  2508*  2517  2519*  2521#
COAX    001550            433#  1049*  1575*
COAXSW  001546            432#   517*   556*   585*   614*   643*  1049  1575  2789
CONT    001576            440    442#
COUNT   015676            920    922  2496#  2518
COUNTA  015672            918    977  1010  2495#
CR    = 000015             21#  3274  3284
CRLF  = 000200             22#  3245  3284
CROSS   015642            149  2483#
DCATST  006270           1168#
DCONT   016002           2272  2279  2525#
DDISP = 177570             28#   214   466
DELAY   016666           1050  1061  1078  1095  1117  1125  1149  1157  1208  1257  1286  1331  1457
```

```
                    1467    1483    1576    1594    1613    1637    1659    1681    1703    1730    1757    1784    1811
                    1837    1864    1891    1918    1944    1971    1998    2025    2051    2078    2105    2132    2157
                    2184    2210    2237    2252    2255    2294    2298    2314    2335    2353    2356    2359    2374
                    2377    2380    2385    2398    2401    2421    2588    2691#   2777
DETECT  003340       497     536     565     594     623     692#
DETEC7  003222       533     650#
DETERO  002062       495#
DETER1  002312       532     534#
DETER2  002474       563#
DETER3  002656       592#
DETER4  003040       621#
DEVTMP  004360       791*    792*    796     835#    1298*   1299*   1303
DFD     024322       302     308     314     320     326     332     339     345     351     357     363     369     375
                     381     387    3705#
DH1     024004       300     306    3665#
DH15    024176       373    3689#
DH16    024212       379     385    3691#
DH3     024060       312    3673#
DH4     024106       318    3677#
DH5     024136       324    3682#
DH6     024151       330     337     343     349     355     361     367    3685#
DISPLA  001142       214#    466*    474*   2914*   2934*
DISPRE  000174       144#    474
DISPY   015770      2268    2275    2283    2286    2523#
DSWR    = 177570      27#     213     465
DT1     024226       301     307    3694#
DT15    024300       374    3702#
DT16    024306       380     386    3703#
DT3     024234       313    3695#
DT4     024246       319    3697#
DT5     024260       325    3699#
DT6     024266       331     338     344     350     356     362     368    3700#
DUALPL  007346      1317    1337#
EMTVEC= 000030       116#    453*    454*
EM1     023032       299    3577#
EM10    023430       342    3622#
EM11    023465       348    3627#
EM12    023524       354    3633#
EM13    023563       360    3639#
EM14    023611       366     372    3643#
EM16    023635       378    3647#
EM17    023714       384    3655#
EM2     023133       305    3588#
EM3     023214       311    3597#
EM4     023254       317    3603#
EM5     023300       323    3607#
EM6     023336       329    3612#
EM7     023374       336    3617#
ERRVEC= 000004       109#    463     464*    475*    693*    697*    706*    707*    770*    781*    782*   2626*   2897
                    2898*   2900*   2903*
FILBUF  016132      1111    2549    2557#
FILLWC  016076      1094    2548#
FRANKD  016322       150    2609#
GENER   006354      1180#   1184    1199    1207
GENRX   006426      1188    1192#
GNS     = ****** U   143    3549    3550    3551    3552    3553    3555    3557    3558    3559    3560
```

```
GTSWR = 104406          3555#
HATCH   015442           148    2440#
HATCHD  015510          2442    2445    2452#
HOME    017256          1093    1106    1119    1135    1139    1151    1167    1210    1219    1288    2777#
HT    = 000011            19#   3243    3284
IOTVEC= 000020           114#    451*    452*
JOHNK = ****** U         969    1568
KE      001500           413#   2548
LASTCH  001532           426#   1122    1154    2574
LBMT    006566          1224#
LBMT1   006732          1241    1256#
LCM     006744          1261#
LDLIN   017554          1729    1756    1783    1810    1836    1863    1890    1917    1943    1970    1997    2024    2050
                        2077    2104    2131    2156    2183    2209    2236    2830#
LF    = 000012            20#   3278    3284
LIC     016166          1142    2570#
LODADR  003576           499     538     567     596     625     736#  1314    2441    2484    2610
LODSEQ  016774          2330    2414    2717#
LODSTA  017062          1588    1631    1653    1675    1697    1716    1743    1770    1797    1823    1850    1877    1904
                        1930    1957    1984    2011    2037    2064    2091    2118    2144    2170    2196    2223    2333
                        2417    2742#
MAPIND  017526          2788*   2792*   2796*   2822#
MAPRET  007174          1304    1306#   2433
MAPRTA  007362          1300    1313    1333    1344#
MAPRTB  007160          1303#   1310
MOVADR  003730           755#   1329    2444    2614
MOVDN1  006676          1227    1244#   1247
MOVDWN  006672          1234    1243#
MOVRIG  006714          1228    1230    1231    1235    1237    1238    1250#
MSAVE0  001552           434#    482*    503*    508*    512*    513*    514     520     524
MSAVE1  001554           435#    483*    542*    547*    551*    552*    553     559
MSAVE2  001556           436#    484*    571*    576*    580*    581*    582     588
MSAVE3  001560           437#    485*    600*    605*    609*    610*    611     617
MSAVE4  001562           438#    486*    629*    634*    638*    639*    640     646
MSGIND  017254          1175    2775#
MSGTXT  017154          1173    2764#
NOCHAR  007112          1295#
NUMBR   007370          1305    1351#
NUMPIX  001542           430#   1722    1749    1776    1803    1829    1856    1883    1910    1936    1963    1990    2017
                        2043    2070    2097    2124    2149    2176    2202    2229    2720
OVRAL   017152          1170*   1206*   2763#
PIRQ  = 177772            26#
PIRQVE= 000240           120#
PR0   = 000000            43#
PR1   = 000040            44#
PR2   = 000100            45#
PR3   = 000140            46#
PR4   = 000200            47#
PR5   = 000240            48#
PR6   = 000300            49#
PR7   = 000340            50#
PS    = 177776            23#    24
PSW   = 177776            24#
PWRMSG  021154          3190    3197#
PWRVEC= 000024           115#    467*    458*    3159*   3160*   3169*   3175*   3187*   3188*
RDCHR = 104410          3454    3558#
```

```
RDLIN = 104411          3495    3559#
RDOCT = 104412          3560#
RESTAT  002060           488     491#    683
RESVEC= 000010           110#
RETURN  007366           496*    535*    564*    593*    622*   1344   1346#
SAVE0   001510           417#    921*    925     932     934    3697
SAVE1   001512           418#    512     514     551     553     580    582    609    611    638    640    720*
SAVE2   001514           419#    923*    924     928     938    3697
SAVE3   001516           420#   1014*   1015*   1016
SET     017150          1171*   1177*   1186*   1189*   1196*  1197   2762#
STACK = 001100             14#    449    2440    2483    2609   2625
STCHAR  001530           425#   1107*   1110    1121*   1122   1137*  1141   1153*  1154
STKLMT= 177774            25#
SWR     001140          213#    447     465*    467     473*    480*  1055   1072   1091   1104   1134   1165   1217
                       1581    1603    1624    1646    1668    1690   1712   1739   1766   1793   1819   1846   1873
                       1900    1926    1953    1980    2007    2033   2060   2087   2114   2140   2166   2192   2219
                       2246    2263    2306    2326    2347    2368   2399   2410   2487   2620   2698   2786   2892
                       2906    2908    2939    2951    3167    3180*  3351   3388*
SWREG   000176          145#    473    3351    3364
SWD   = 000001           78#
SWD0  = 000001           68#     78
SWD1  = 000002           67#     77
SWD2  = 000004           66#     76
SWD3  = 000010           65#     75
SWD4  = 000020           64#     74
SWD5  = 000040           63#     73
SWD6  = 000100           62#     72
SWD7  = 000200           61#     71
SWD8  = 000400           60#     70
SWD9  = 001000           59#     69    1581    1603    1624    1646    1668   1690   1712   1739   1766   1793   1819
                       1846    1873    1900    1926    1953    1980    2007   2033   2060   2087   2114   2140   2166
                       2192    2219    2246    2263    2306    2326    2347   2368   2389   2410
SW1   = 000002           77#
SW10  = 002000           58#    1055    1072    1091    1104    1134   1165   1217
SW11  = 004000           57#
SW12  = 010000           56#
SW13  = 020000           55#
SW14  = 040000           54#
SW15  = 100000           53#
SW2   = 000004           76#
SW3   = 000010           75#
SW4   = 000020           74#
SW5   = 000040           73#
SW6   = 000100           72#
SW7   = 000200           71#
SW8   = 000400           70#
SW9   = 001000           69#
TABLE1  016446          2335    2633#
TABLE2  016466          1718    1745    1772    1799    2146   2172   2198   2225   2639#
TABLE3  016506          1590    2645#
TABLE4  016526          1633    1655    1677    1699    2651#
TABLE5  016546          2419    2657#
TABLE6  016606          1825    1852    1879    1906    2669#
TABLE7  016626          1932    1959    1986    2013    2675#
TABLE8  016646          2039    2066    2093    2120    2681#
TBITVE= 000014           111#
```

```
TEMP0   001534          427#   1109*  1115*  1120*  1140*  1147*  1152*
TEMP1   001502          414#    789*   790*   799*   811   1296*  1297*  1306*  1351   1352   1353   1354
TEMP2   001504          415#    695*   701*   702    716    720    723*
TEMP3   001506          416#    696*   722*   725*   726*   728    795*   796    801*   802    1302*  1303   1308*
                       1309
TESTID  017306         1584    1605   1626   1648   1670   1692   1714   1741   1768   1795   1821   1848   1875
                       1902    1928   1955   1982   2009   2035   2062   2089   2116   2142   2168   2194   2221
                       2248    2265   2308   2328   2349   2370   2391   2412   2786#
TITLE   022712          490    3563#
TKVEC = 000060          118#
TOTALC  001520          421#   1170
TPVEC = 000064          119#
TRAPVE= 000034          117#    455*   456*
TRTVEC= 000014          112#
TSTIND  017550         2798*   2801*  2805*  2811*  2826#
TST1    003762          519     558    587    616    645    764#
TST10   004666          898     903#
TST100  015220         2367    2369   2386#
TST101  015322         2388    2390   2407#
TST102  015434         2409    2411   2432#
TST11   004736          910     916#
TST12   005100          945#
TST13   005202          963     972#
TST14   005336          988     999   1005#
TST15   005526         1046#
TST16   005636         1054    1056   1069#
TST17   005730         1071    1073   1088#
TST2    004074          787#
TST20   005766         1090    1092   1101#
TST21   006112         1103    1105   1131#
TST22   006244         1133    1135   1162#
TST23   006534         1164    1166   1214#
TST24   007110         1216    1218   1294#
TST25   007450         1363#
TST26   007514         1369    1375#
TST27   007560         1381    1387#
TST3    004362          805     839#
TST30   007624         1393    1399#
TST31   007712         1414#
TST32   007762         1421    1426#
TST33   010036         1435    1441#
TST34   010074         1447    1453#
TST35   010256         1495    1501#
TST36   010354         1520#
TST37   010470         1544#
TST4    004434          846     852#
TST40   010626         1572#
TST41   010724         1580    1582   1600#
TST42   011012         1602    1604   1621#
TST43   011106         1623    1625   1643#
TST44   011202         1645    1647   1665#
TST45   011276         1667    1669   1687#
TST46   011372         1689    1691   1709#
TST47   011504         1711    1713   1736#
TST5    004500          858     864#
TST50   011616         1738    1740   1763#
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TST53   012154          1818    1820    1843#
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TST55   012400          1872    1874    1897#
TST56   012512          1899    1901    1923#
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TST60   012736          1952    1954    1977#
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TST62   013162          2006    2008    2030#
TST63   013274          2032    2034    2057#
TST64   013406          2059    2061    2084#
TST65   013520          2086    2088    2111#
TST66   013632          2113    2115    2137#
TST67   013744          2139    2141    2163#
TST7    004630           892#
TST70   014060          2165    2167    2189#
TST71   014174          2191    2193    2216#
TST72   014320          2218    2220    2243#
TST73   014406          2245    2247    2260#
TST74   014612          2262    2264    2303#
TST75   014712          2305    2307    2323#
TST76   015014          2325    2327    2344#
TST77   015116          2346    2348    2365#
TYPDS = 104405           672    3553#
TYPE  = 104401           489     670     673     712     715     719    2942    2970    2937    2989    2992    2994    2998
                        3005    3070    3145    3189    3248    3362    3363    3366    3379    3390    3409    3458    3461
                        3465    3549#
TYPOC = 104402           714    2978    3002    3365    3550#
TYPON = 104404          3552#
TYPOS = 104403           717    3551#
VCCSR   001446           393#    736     842*    843     854*    855     866*    867     881*    882     887*    894*    896
                         905*    906*    907     917*    946*    948     955*    956     962     976*    986*    998*   1009*
                        1021*   1025*   1035*   1057*   1074*   1083*   1220*   1289*   2239*   2485*   2498    2537    2539*
                        2618*   2700*   2702*   2781    2831*   3695    3697    3699
VCHRHI  001452           395#    742*   1077*
VCHRLO  001450           394#    741*   1059*   1060*   1076*   2487*   2620*   2830*
VCINT   001470           403#    739     749*    750*    751     978*   1011*   1028*   2691*   2706*
VCINT1  001472           404#    751*    752*    979*    991*   1012*   2692*   2706    2707*
VCPOS   001454           396#    743*   1201*   2812*
VCPOSH  001456           397#    744*   1200*   2813*
VGBUF   001464           400#    747*    757*   1353*   1356*   1524*   1549*   1553*   1635*   1657*   1679*   1701*   1721
                        1748    1775    1802    1828    1855    1882    1909    1935    1962    1989    2016    2042    2069
                        2096    2123    2148    2174    2200    2227    2458*   2464*   2467*   2528*   2726*   2729*
VGCOLR  001466           401#    748*    758*   1324*   1354*   1357*   1612*   2250*   2290*   2291*   2310*   2352*   2355*
                        2358*   2373*   2376*   2379*   2394*   2397*   2400*   2475*   2476*   2612*   2616*   2749*
VGCSR   001460           398#    745*    755*   1325*   1326*   1351*   1365*   1366    1377*   1378    1389*   1390    1402*
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                        1506    1526    1531    1551    1554    1556    1592*   1609*   1629*   1636*   1651*   1658*   1673*
                        1680*   1695*   1702*   1723    1728*   1750    1755*   1777    1782*   1804    1809*   1830    1835*
                        1857    1862*   1884    1889*   1911    1916*   1937    1942*   1964    1969*   1991    1996*   2018
                        2023*   2044    2049*   2071    2076*   2098    2103*   2125    2130*   2150    2155*   2177    2182*
                        2203    2208*   2230    2235*   2251*   2254*   2293*   2297*   2311*   2313*   2332*   2351*   2372*
                        2393*   2416*   2420*   2426*   2443*   2446*   2456    2462    2465    2523*   2525*   2526    2529*
                        2593*   2594    2613*   2617*   2724    2727    3700    3702
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                       2068*  2095*  2122*  2147*  2173*  2195*  2226*  2454*  2524*  2719*
VHD     001524          423#  1109   1120   1140   1152   1171   1183   2550
VHI     001526          424#  1225   1243   1261   1273
VTHDR1  022750          712   3568#
VTHDR2  022774          715   3572#
VTHDR3  023002          719   3573#
WIDTH   001522          422#  1143   1189   2557
XADDS   017146         1195*  1201   2761#
XHAIR   001536          428#  1064
XPRNT   016032         1113   1145   1204   1256   1285   2533#  2551   2780
XPRNTA  016036         2534#  2815
YADDS   017144         1185*  1200   2760#
YHAIR   001540          429#  1081
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$ATY4   021522         2947   3290#
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                        843*   844*   845    855*   856*   857    867*   868*   869    882*   883*   884    896*
                        897*   907*   908*   909    924*   925*   928*   929*   930*   931*   932    934*   935*
                        936*   937*   938    948*   956*   962*  1366*  1367*  1368   1378*  1379*  1380   1390*
                       1391*  1392   1403*  1404*  1405   1418*  1419*  1420   1432*  1433*  1434   1445*  1446*
                       1456*  1460*  1469*  1470   1477   1486*  1487   1494   1506*  1507*  1508   1531*  1532*
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$CNTLU  022472         3379   3474#
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$ENDCT  003252          459    668#
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$ERTTL  001112          200#  2935*  2961
$ETABL  001212          244#
$ETEND  001256          185    279#
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                       1377   1380  1388*  1389  1392  1401*  1402  1405  1408*  1409  1415*  1420  1427*
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$MAIL   001172          181    185    235#   477  2911  2944  3228
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                       1438#  1450#  1498#  1517#  1541#  1569#  1597#  1618#  1640#  1662#  1684#  1706#  1733#
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                       2429#
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$OMODE  020554         3037*  3041*  3046   3049*  3060*  3086#
$OVER   020022         2893   2904   2909   2914#
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                       1710   1737   1764   1791   1817   1844   1871   1898   1924   1951   1978   2005   2031
                       2058   2085   2112   2138   2164   2190   2217   2244   2261   2304   2324   2345   2366
                       2387   2408
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                        973   1006   1047   1070   1089   1102   1132   1163   1215   1295   1364   1376   1388
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                       1688   1710   1737   1764   1791   1817   1844   1871   1898   1924   1951   1978   2005
                       2031   2058   2085   2112   2138   2164   2190   2217   2244   2261   2304   2324   2345
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.$X   = 001000          169#   174
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         2157    2184     2210     2237     2252     2256     2314     2336     2353     2356     2359     2374     2377     2380     2385
         2398    2401     2421
DELAY1    439#   1613
ENDCOM      1#    121#
ERROR      15#    516      522      529      555      561      584      590      613      619      642      648      778      831      847
          859     871      886      899      911      927      940      950      958      966      987     1001     1026     1036     1370
         1382    1394     1407     1422     1436     1448     1462     1472     1479     1489     1496     1510     1530     1535     1560
         2504    2513     2600
ESCAPE      1#    121#
FIXADX    495#    496      535      564      593      622
GETPRI      1#    121#
GETSWR      1#    121#
HOME      439#   1093     1106     1119     1136     1139     1151     1167     1210     1219     1288
INHO9     439#   1578     1601     1622     1644     1666     1688     1710     1737     1764     1791     1817     1844     1871     1898
         1924    1951     1978     2005     2031     2058     2085     2112     2138     2164     2190     2217     2244     2261     2304
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INHIO     439#   1052     1070     1089     1102     1132     1163     1215
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LDXLIN    439#   1729     1756     1783     1810     1836     1863     1890     1917     1943     1970     1997     2024     2050     2077
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MULT        1#    121#
NEWTST      1#    121#     761      784      836      849      861      873      889      900      913      942      969     1002     1043
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         1498    1517     1541     1569     1597     1618     1640     1662     1684     1706     1733     1760     1787     1813     1840
         1867    1894     1920     1947     1974     2001     2027     2054     2081     2108     2134     2160     2186     2213     2240
         2257    2300     2320     2341     2362     2383     2404     2429
POP         1#    121#    2870     3140     3180     3181     3330     3331     3513
PUSH        1#    121#    2851     3099     3161     3167     3291     3293     3314     3492
REPORT      1#    121#
SCOPE      16#    764      787      839      852      864      876      892      903      916      945      972     1005     1046     1069
         1088    1101     1131     1162     1214     1294     1363     1375     1387     1399     1414     1426     1441     1453     1501
         1520    1544     1572     1600     1621     1643     1665     1687     1709     1736     1763     1790     1816     1843     1870
         1897    1923     1950     1977     2004     2030     2057     2084     2111     2137     2163     2189     2216     2243     2260
         2303    2323     2344     2365     2386     2407     2432
SETPRI      1#    121#
SETTRA   3541#   3550     3551     3552     3553     3555     3557     3558     3559     3560
SETUP       1#    121#     442
SKIP        1#    121#     773      804      846      858      870      885      898      910      926      933      949      957      963
          988     999     1022     1037     1054     1056     1071     1073     1090     1092     1103     1105     1133     1135     1164
         1166    1216     1218     1241     1369     1381     1393     1406     1421     1435     1447     1461     1471     1478     1488
         1495    1509     1534     1539     1559     1580     1582     1602     1604     1616     1623     1625     1645     1647     1667
         1669    1689     1691     1711     1713     1738     1740     1765     1767     1792     1794     1818     1820     1845     1847
         1872    1874     1899     1901     1925     1927     1952     1954     1979     1981     2006     2008     2032     2034     2059
         2061    2086     2088     2113     2115     2139     2141     2165     2167     2191     2193     2218     2220     2245     2247
         2262    2264     2305     2307     2325     2327     2346     2348     2367     2369     2388     2390     2409     2411
SLASH       1#    121#
SPACE     121#
STARS       1#    121#     155      166      168      175      188      230      233      653      761      763      784      786      836
          838     849      851      861      863      873      875      889      891      900      902      913      915      942      944
          969     971     1002     1004     1043     1045     1066     1068     1085     1087     1098     1100     1128     1130     1159
         1161    1211     1213     1291     1293     1360     1362     1372     1374     1384     1386     1396     1398     1411     1413
         1423    1425     1438     1440     1450     1452     1498     1500     1517     1519     1541     1543     1569     1571     1597
         1599    1618     1620     1640     1642     1662     1664     1684     1686     1706     1708     1733     1735     1760     1762
```

```
        1787    1789    1813    1815    1840    1842    1867    1869    1894    1896    1920    1922    1947    1949    1974
        1976    2001    2003    2027    2029    2054    2056    2081    2083    2108    2110    2134    2136    2160    2162
        2186    2188    2213    2215    2240    2242    2257    2255    2300    2302    2320    2322    2341    2343    2362
        2364    2383    2385    2404    2406    2429    2431    2842    2879    2920    2964    3012    3089    3157    3173
        3207    3286    3343    3346    3414    3443    3482    3520
SWRSU      1#    121#    461#
TESTID   439#   1583    1605    1626    1648    1670    1692    1714    1741    1768    1795    1821    1848    1875    1902
        1928    1955    1982    2009    2035    2062    2089    2116    2142    2168    2194    2221    2248    2308    2328
        2349    2370    2391    2412
TRMTRP  3541#
TYPBIN     1#    121#
TYPDEC     1#    121#    671
TYPNAM     1#    121#
TYPNUM     1#    121#
TYPOCS     1#    121#
TYPOCT     1#    121#   2976    3000    3364
TYPTXT     1#    121#
$$CMRE   186#    225     226
$$CMTM   186#
$$ESCA     1#    121#
$$NEWT     1#    121#    761     784     836     849     861     873     889     900     913     942     969    1002    1043
        1066    1085    1098    1128    1159    1211    1291    1360    1372    1384    1396    1411    1423    1438    1450
        1498    1517    1541    1569    1597    1618    1640    1662    1684    1706    1733    1760    1787    1813    1840
        1867    1894    1920    1947    1974    2001    2027    2054    2081    2108    2134    2160    2186    2213    2240
        2257    2300    2320    2341    2362    2383    2404    2429
$$SET   3541#   3550    3551    3552    3553    3555    3557    3558    3559    3560
$$SETM   477#
$$SKIP     1#    121#    805     846     858     870     898     910     963     988     999    1054    1056    1071    1073
        1090    1092    1103    1105    1133    1135    1164    1166    1216    1218    1369    1381    1393    1421    1435
        1447    1495    1580    1582    1602    1604    1623    1625    1645    1647    1667    1669    1689    1691    1711
        1713    1738    1740    1765    1767    1792    1794    1818    1820    1845    1847    1872    1874    1899    1901
        1925    1927    1952    1954    1979    1981    2006    2008    2032    2034    2059    2061    2086    2088    2113
        2115    2139    2141    2165    2167    2191    2193    2218    2220    2245    2247    2262    2264    2305    2307
        2325    2327    2346    2348    2367    2369    2388    2390    2409    2411
.EQUAT     1#     11
.HEADE     1#
.KT11      1#
.SETUP     1#    441
.SWRHI     1#    126
.SWRLO   136#
.$ACTI     1#    153
.$APTB     1#    231#
.$APTH     1#    164
.$APTY     1#   3284
.$ASTA     1#
.$CATC     1#    137
.$CMTA     1#    186
.$DB2D     1#
.$DB2O     1#
.$DIV      1#
.$EOP      1#    650
.$ERRO     1#   2918
.$ERRT     1#   2962
.$MULT     1#
.$PARM     1#
.$POWE     1#   3155
```

```
.$RAND      1#   2840
.$RDDE      1#
.$RDOC      1#   3480
.$READ      1#   3341
.$RZAZ      1#
.$SAVE      1#
.$SB2D      1#
.$SB2O      1#
.$SCOP      1#   2877
.$SIZE      1#
.$SPAC      1#
.$SUPR      1#
.$SWDO      1#
.$TRAP      1#   3518
.$TYPB      1#
.$TYPD      1#   3087
.$TYPE      1#   3205
.$TYPO      1#   3010
.$4DCA      1#
.1170       1#
```

```
. ABS.  024332     000
```

```
ERRORS DETECTED:  0
DEFAULT GLOBALS GENERATED:  0

.DZVSEA.SEQ/CRF/SOL/NL:TOC=DSKZ:SYSMAC.SML,DZVSEA.P11
RUN-TIME:  68 65 5 SECONDS
RUN-TIME RATIO: 286/138=2.0
CORE USED:  34K  (67 PAGES)
```

Spooler runtime 16 Seconds, 70 KCS, 405 disk reads, 3 disk writes, 95 pages

[redacted] Date 03-Dec-76 10:25:16 Monitor IPC-D 602 [680] ##END##