GT40/GT44

VISUAL DISPLAY TEST

MD-11-DDGTG-B

EP-DDGTG-B-DL-B

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FICHE 1 OF 1

DEC 1976

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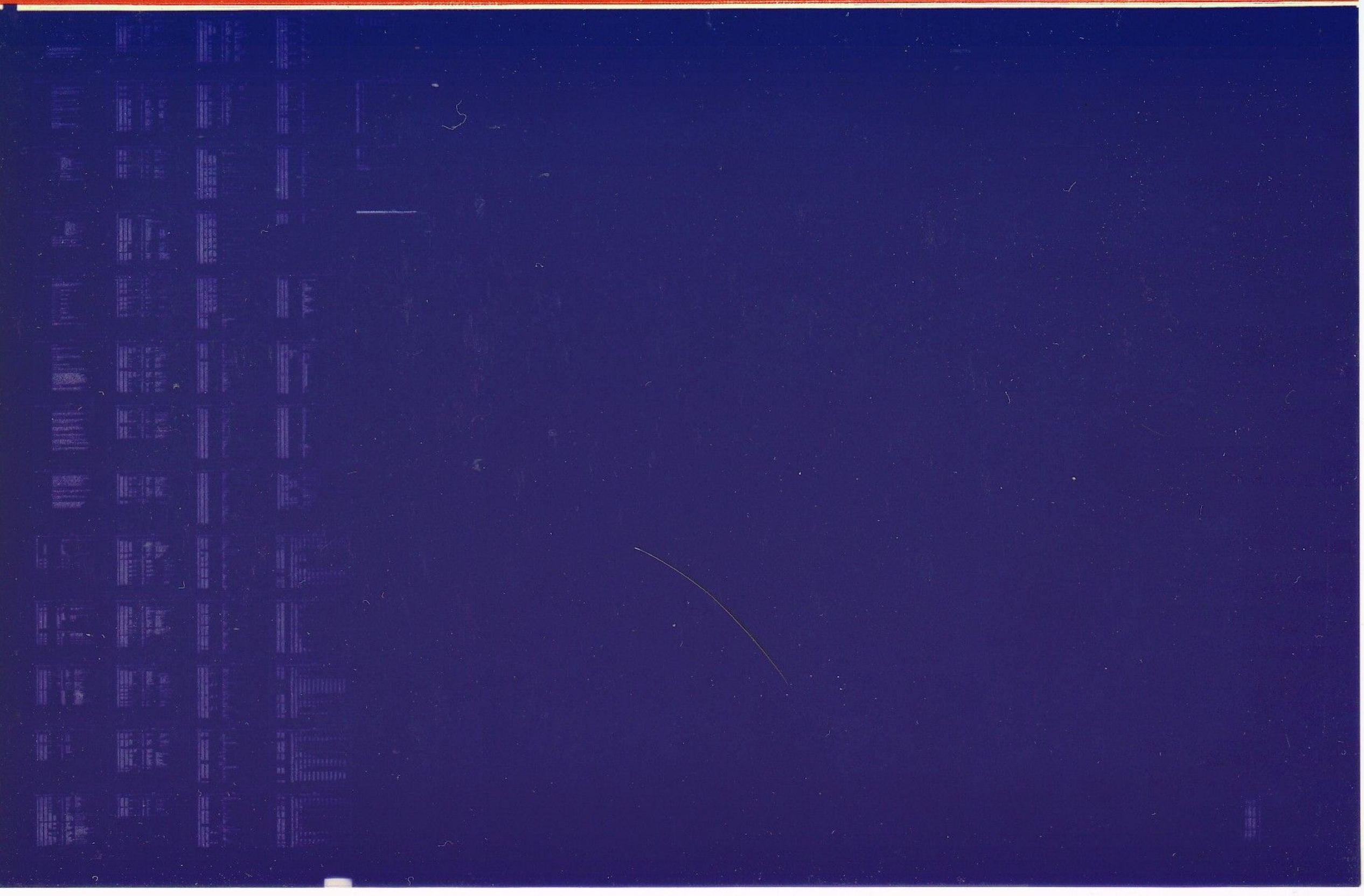
MADE IN USA



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.REM  *
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IDENTIFICATION

PRODUCT CODE:	MAINDEC-11-DDGTG-B-D
PRODUCT NAME:	GT40/GT44 VISUAL DISPLAY TEST WITH VR17 DISPLAY
DATE:	DECEMBER 1976
MAINTAINER:	DIAGNOSTIC GROUP

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1. ABSTRACT

THIS VERSION OF THE PROGRAM SUPPORTS NON-SWITCH REGISTER CPU'S. FOR THESE CPU'S, THE SWITCH REGISTER CAN BE CHANGED BY CHANGING THE CONTENTS OF SWREG (170).

THIS PROGRAM CONTAINS A SERIES OF PATTERNS THAT ARE USED AS AIDS IN THE ALIGNMENT AND ADJUSTMENT OF THE GT40/GT44 DISPLAY SYSTEM WITH A VR17. FOR THIS TEST THE MAINTENCE SWITCHES ARE NOT USED (NORMAL POSITION).

2. REQUIREMENTS

2.1 EQUIPTMENT

GT40 DISPLAY SYSTEM WITH VR17 DISPLAY SCOPE OR
GT44 DISPLAY SYSTEM WITH VR17 DISPLAY SCOPE.

2.2 STORAGE

THIS PROGRAM USES LESS THAN 4K OF MEMORY.

2.3 PRELIMINARY PROGRAMS

ALL PROCESSOR MAINDECS, GT40/GT44 INSTRUCTION TEST I AND GT40/GT44 INSTRUCTION TEST II MUST HAVE RUN IN THEIR ENTIRETY BEFORE ATTEMPTING TO RUN THIS TEST.

3. LOADING PROCEDURE

3.1 METHOD

PROCEDURE FOR NORMAL BINARY TAPES SHOULD BE FOLLOWED.

4. STARTING PROCEDURE

4.1 STARTING ADDRESS

LOAD ADDRESS 0200
START WITH SWITCHES 7=0, 8=0 FOR AUTO SEQUENCING THRU ALL NON-OPERATOR INVERVENTION PATTERNS.
START WITH SWITCH BIT 7=0, 8=1 FOR SWITCH REGISTER PATTERN CONTROL (REF 4.2).
START WITH SWITCH BIT 7=1, 8=0 OR 1 FOR KEYBOARD PATTERN CONTROL (REF 4.3).

4.2 CONTROL SWITCH SETTINGS (SWITCH REGISTER)

SWITCH REGISTER BITS 0,1,2,3 ARE USED TO SELECT
EACH OF THE TESTS.

NON-OPERATOR INTERVENTION TESTS

```
SW 3-0  =  00   /DIRECTORY
           01   /DOT REPEATIBILITY
           02   /PINCUSHION <X AND Y OFFSET ADJ.>
           03   /OCTAGONS OR SQUARES
           04   /CHARACTER SET <CHAR ADJ.>
           05   /DASH LINES AND BLINK
           06   /VECTOR LENGTH TEST < X VECTOR LENGTH ADJ.>
           07   /VECTOR LENGTH TEST < Y VECTOR LENGTH ADJ.>
           10   /PHOSPHOR TEST <HORIZ>
           11   /PHOSPHOR TEST <VERT>
           12   /INTENSITY LEVELS, SYNC AND LIGHT-PEN TEST
           13   /EDGE TEST
           14   /SHORT VECTOR AND RELATIVE POINT TEST
           15   /GRAPHPLOT INCREMENT TEST
```

OPERATOR INTERVENTION TESTS

```
           16   /LIGHT-PEN FOLLOW TEST
           17   /KEYBOARD ECHO

SW 6 = 0        SELECT SUB-PICTURE 0
SW 6 = 1        SELECT SUB-PICTURE 1 OR
                STOP DISPLAY FRAME MOTION

SW 8 = 0        EXECUTE ALL NON-OPERATOR INTERVENTION FRAMES.
SW 8 = 1        EXECUTE THE DISPLAY FRAME SPECIFIED BY SW 0-3.
```

4.3 CONTROL SWITCH SETTINGS (DISPLAY KEYBOARD)

ALPHA CHARACTERS 'A' THRU 'P' ARE USED TO SELECT EACH OF THE TESTS.

CHARACTER	TEST
A	DIRECTORY
B	DOT REPEATIBILITY
C	PINCUSHION (X AND Y OFFSET ADJ.)
D	OCTAGONS OR SQUARES
E	CHARACTER SET <CHAR. ADJ.>
F	DASH LINES AND BLINK
G	VECTOR LENGTH TEST <X VECTOR LENGTH ADJ.>
H	VECTOR LENGTH TEST <Y VECTOR LENGTH ADJ.>
I	PHOSPHOR TEST <HORIZ>
J	PHOSPHOR TEST <VERT>
K	INTENSITY LEVELS, SYNC AND LIGHT-PEN TEST
L	EDGE TEST
M	SHORT VECTOR AND RELATIVE POINT
N	GRAPHPLOT INCREMENT TEST
O	LIGHT-PEN FOLLOW TEST
P	KEYBOARD ECHO

DEPRESSING A 'RUBOUT' AFTER SELECTING A FRAME WILL LOCK ON THE SELECT FRAME.

DEPRESSING A 'CR' AFTER SELECTING A FRAME WILL SELECT SUB-PICTURE 1 OR STOP DISPLAY FRAME MOTION.

TO CONTINUE AFTER DEPRESSING A 'CR' OR 'RUBOUT' DEPRESS ANY KEY OTHER THAN 'CR' OR 'RUBOUT'.

DEPRESSING 'CONTROL C <↑C>' WHEN EXECUTING THE KEYBOARD ECHO TEST, WILL RETURN CONTROL TO THE DIRECTORY FRAME.

5. OPERATING PROCEDURE

5.1 OPERATIONAL SWITCHES

ALL OF THE TEST WILL RUN IN THEIR NORMAL MANNER WITHOUT ANY OPERATIONAL SWITCHES SELECTED. HOWEVER, SOME OF THE TESTS HAVE ADDITIONAL FEATURES AND THE ARE SELECTED BY USING SWITCH BIT 06 OR "CR" KEYBOARD KEY.

5.1.1 PINCUSHION TEST

SW 6 = 0 DISPLAY PINCUSHION
SW 6 = 1 DISPLAY CROSSHATCH (IN-HOUSE TEST ONLY)

5.1.2 OCTAGON OR SQUARES

SW 6 = 0 DISPLAY OCTAGONS
SW 6 = 1 DISPLAY SQUARES

5.1.3 VECTOR LENGTH TEST

SW 6 = 0 SWEEP MOVEMENT
SW 6 = 1 STOP MOVEMENT

5.1.4 PHOSPHOR TEST

SW 6 = 0 SWEEP ACROSS THE SCREEN
SW 6 = 1 STOP MOVEMENT

5.1.5 INTENSITY TEST

SW 6 = 0 ENABLE SYNC 'OFF'
SW 6 = 1 ENABLE SYNC 'ON'

5.1.6 GRAPHPLOT INCREMENT TEST

SW 6 = 0 USE GRAPHPLOT X
SW 6 = 1 USE GRAPHPLOT Y

5.1.7 LIGHT PEN FOLLOW

SW 6 = 0 DISPLAY LIGHT PEN FOLLOW
SW 6 = 1 DISPLAY LIGHT PEN FIELD OF VIEW
          (IN-HOUSE TEST ONLY)

6. ERRORS

THE PROGRAM WILL ONLY HALT ON ERROR.
THE PROGRAM DOES NOT CONTAIN FACILITES FOR THE REPORTING OF ERROR CONDITIONS.

7. RESTRICTIONS

IF USING THE SWITCH REGISTER (REF 4.2) TO CONTROL THE
PROGRAM, THERE WILL BE A DELAY BEFORE THE
NEW TEST IS SELECTED.

8. MISCELLANEOUS

8.1 DEVICE ADDRESS PROGRAM LOCATIONS

LOCATION 1000 CONTAINS THE GT40/GT44 DEVICE ADDRESS.
LOCATION 1002 CONTAINS THE GT40/GT44 INTERRUPT VECTOR.
LOCATION 1004 CONTAINS THE GT40/GT44 INTERRUPT BR LEVEL.

9. PROGRAM DESCRIPTION

9.1 DIRECTORY

THIS TEST USES THE CHARACTER MODE TO DISPLAY A DIRECTORY
OF THE TESTS THAT ARE AVAILABLE.

9.2 DOT REPEATIBILITY

THIS TEST INTENSIFIES A DOT IN EACH CORNOR AND A DOT IN THE
CENTER OF THE SCREEN. THIS TEST IS USED TO VERIFY DOT REPEATIBILITY.

9.3 PINCUSHION AND VECTOR CURVATURE TEST ‹ADJUSTMENT OF X AND Y OFFSET POTS›

THIS TEST OUTLINES THE FULL SCREEN AREA, IT IS USEFUL
IN CENTERING THE VIEWING AREA IN THE DISPLAY MASK.
THIS TEST ALSO DRAWS A DIAGONAL LINE FROM LOWER LEFT CORNER
TO THE UPPER RIGHT AND THEN RETURNS IN THE OPPOSITE DIRECTION.
A SIMILAR SEQUENCE IS REPEATED STARTING AT LOWER RIGHT
CORNER TO THE UPPER LEFT CORNER AND BACK. THE PURPOSE IS TO MAKE
CERTAIN THAT THE VECTORS ARE LINEAR OVER THEIR ENTIRE LENGTH.
WITH PROPER LENGTH VECTORS ONLY TWO DIAGONAL LINES SHOULD BE SEEN
IN THE CENTER OF THE SCREEN. DO NOT ADJUST THE VECTOR LENGTH
POTS WITH THIS DISPLAY PATTERN. SINGLE LINES SHOULD BE VISABLE
AT THE TOP AND BOTTOM OF THE SCREEN, IF NOT ADJUST THE Y OFFSET POT.
SINGLE LINES SHOULD BE VISABLE AT THE RIGHT AND LEFT EDGE
OF THE SCREEN IF NOT ADJUST THE X OFFSET POT..

9.4 OCTAGONS OR SQUARES

A SERIES OF DIFFERENT SIZE OCTAGONS OR SQUARES ARE DRAWN TO
DEMONSTRATE THAT CLOSED FIGURES CAN BE DRAWNED USING
DIFFERENT VECTOR LENGTHS (7,17,37,77,177,377 AND 777).
THIS TEST IS USED TO TEST THE END POINT MATCHING OF THE VECTORS.

9.5 CHARACTER SET ‹ADJUSTMENT OF THE CHARACTER POT'S›

TWO COMPLETE SETS OF ASCII CHARACTERS AVAILABLE FROM THE
CHARACTER GENERATOR ARE DISPLAYED. THE CHARACTERS ARE DISPLAYED IN FOUR
LINES OF TEXT. THE FIRST HALF OF A LINE IS IN 'NORMAL' FONT
THE SECOND HALF OF A LINE IS IN 'ITALICS' FONT.

9.6 DASH LINES AND BLINK TEST

THIS TEST IS USED TO TEST THE FOUR TYPES OF VECTOR LINES.
FOUR VECTORS ARE PLOTTED USING EACH OF THE FOUR LINE REGISTER VALUES.
THIS TEST ALSO ENABLES THE BLINK OPTION. THE FIRST
VECTOR ON A LINE SHOULD NOT BLINK. THE SECOND
VECTOR ON A LINE SHOULD BLINK.

9.7 VECTOR LENGTH TEST ‹ADJUSTMENT OF X AND Y VECTOR LENGTH›

A SERIES OF INCREMENTING ANGLE VECTORS ARE DRAWNED
FROM THE SCREEN ORGIN TO THE OPPOSITE EDGE OF THE SCREEN.
THESE VECTORS SHOULD TERMINATE ON THE LINE DRAWNED AT THE
VIEWING EDGE. IF THE VECTORS DO NOT END ON THE LINE, ADJUST
THE APPROPIATE VECTOR LENGTH POT.

9.8 PHOSPHOR TEST

A WIDE BAND OF INTENSIFIED VECTORS IS DISPLAYED TO ALLOW FOR
VISUAL INSPECTION OF THE CRT PHOSPHOR. THIS TEST ALSO TEST FOR
ANY DISTORTION IN DEFLECTION CROSS-OVER IN THE SCOPE.

9.9 INTENSITY LEVEL, SYNC AND LIGHT-PEN SENSITIVITY TEST

EIGHT VECTORS ARE DRAWN USING EACH OF THE EIGHT INTENSITY LEVELS.
THE INTENSITY SHOULD BE ADJUSTED SO THAT THE LEVEL 0 IS BARELY
VISABLE. THIS TEST IS ALSO USED TEST
THE LIGHT PEN SENSITIVITY. ALL LINES ARE SET TO ALLOW A LIGHT PEN
HIT, THEN HIT THE MESSAGE 'LIGHT PEN HIT' WILL BE DISPLAYED ON THE
LINE HIT. THIS TEST IS ALSO USED TO TEST THE 'SYNC' LOGIC IF SELECTED.

9.10 EDGE SQUARES TEST

THIS TEST IS USED TO TEST FOR PROPER EDGE BLANKING AND REENTRY SETTLE
TIME. THE SCREEN IS OUTLINED AND FOUR RECTANGLES ARE DRAWNED AS TO
EXCEED THE EDGE OF THE SCREEN. ONLY HALF OF EACH RECTANGLE SHOULD
BE VISIBLE.

9.11 SHORT VECTOR AND RELATIVE POINT TEST

THIS TEST IS USED TO VERIFY PROPER DECODING OF THE SHORT VECTOR AND
RELATIVE POINT. A SERIEC OF INTINIFIED VERTICAL LINES ARE PLOTTED
USING SHORT VECTOR MODE. THE TEST THEN REPEATS USING
RELATIVE POINT. THE RESULTS IS THAT A SINGLE HORIZONTAL LINE APPEARS
TO THE RIGHT OF THE VERTICAL LINES. ALSO INCLUDED IS A RELATIVE POINT
REPEATIBILITY TEST. FOUR SETS OF THREE OCTAGONS EACH WILL
BE DISPLAYED. THE INNER OCTAGON IS DRAWN USING SHORT VECTOR
MODE WITH A DELTA X, Y OF 71 OCT. THE MIDDLE OCTAGON IS
DRAWN USING RELATIVE POINT MODE WITH A DELTA X, Y OF
74 OCT. THE OUTTER OCTAGON IS DRAWN USING SHORT VECTOR MDODE
WITH AN DELTA X,Y OF 77 OCT. THE MIDDLE OCTAGON SHOULD
BE EQUAL DISTANCE FROM THE OUTER OCTAGONS AND SHOULD
NOT MOVE.

9.12 GRAPHPLOT INCREMENT TEST

A SERIES OF POINTS ARE PLOTTED WITH EACH POSSIBLE VALUE IN THE GRAPHPLOT
INCREMENT REGISTER FROM 0-77. THE RESULTING PATTERN USED SHOULD APPEAR
TO BE A SERIES OF POINTS AT AN INCREASING ANGLE.

9.13 LIGHT-PEN FOLLOW TEST

IN THIS OPERATOR INTERVENTION TEST A TRACKING
CROSS IS DISPLAYED. THE OPERATOR MAY MOVE ACROSS THE SCREEN
WITH THE LIGHT PEN. AN X AND Y OCTAL READOUT IS ALSO DISPLAYED
TO THE OPERATOR.

9.14 KEYBOARD ECHO TEST

THIS IS AN OPERATOR INTERVENTION TEST USED TO INSURE PROPER
OPERATION OF THE DISPLAY KEYBOARD. WHEN A DISPLABLE CHARACTER
KEY IS DEPERSSED THE CHARACTER IS DISPLAYED ON THE SCREEN.
IN SELECTING THE SHIFT-OUT MODE, IF THE KEY DEPRESSED
IS NOT A CONTROL CHARACTER, THE PROGRAM WILL TRAP TO
THE SHIFT-OUT VECTOR. AN OCTAL CHARACTER VALUE READOUT
IS ALSO DISPLAYED AS AN AID IN ADJUSTING THE TTY CLOCK.

```
360                     .LIST
361
362
```

```
                                .ENABL  ABS,AMA
                                .TITLE GT-40/GT-44 WITH VR17 VISUAL DISPLAY TEST MAINDEC-11-DDGTG-B
                                .LIST   ME
                                .NLIST  MC,MD,CND

            000000              R0=%0
            000001              R1=%1
            000002              R2=%2
            000003              R3=%3
            000004              R4=%4
            000005              R5=%5
            000006              SP=%6
            000007              PC=%7
            104000              SCOPE=EMT
            000004              ERRVEC=4
            000500              STKPTR=500
            177570              DSWR=177570             ;11/45 LIGHT DISPLAY REGISTER

                                ;0-776 IS FILLED WITH .+2, HALT
                                .LIST

            000024              .=24
000024      001250              .WORD   LOWPWR
000026      000340              340

            000030              .=30
000030      001100              .WORD   SCOPEA          ;EMT RETURN
000032      000340              340

            000170              .=170
000170      000000  SWREG:      .WORD   0
000172      177570  SWR:        .WORD   DSWR
```

```
                    000200                          .=200
000200  000137  001356                    JMP     START   ;DISPLAY TEST

                    001000                          .=1000
001000  172000                  GSADD:  172000          ;DISPLAY STARTING ADDRESS
001002  000320                  GSVCT:  320             ;DISPLAY INTERRUPT VECTOR STARTING ADDRESS
001004  000200                  GSBRL:  200             ;DISPLAY BR LEVEL

001006  000000                  ICNT:   0
001010  177776                  PSW:    177776
001012  177560                  TKS:    177560
001014  177562                  TKB:    177562
001016  012536                  DBUF:   BUFFER          ;FIRST WORD IN THE DISPLAY BUFFER
001020  012540                  DBUF1:  BUFFER+2        ;SECOND WORD
001022  012542                  DBUF2:  BUFFER+4        ;THIRD WORD
001024  012544                  DBUF3:  BUFFER+6        ;FOURTH WORD
001026  012546                  DBUF4:  BUFFER+10       ;FIFTH WORD
001030  012550                  DBUF5:  BUFFER+12
001032  000000                  DSAVE:  0               ;TEMP REG.
001034  000000                  DSAVE1: 0
001036  000000                  DSAVE2: 0
001040  000000                  DSAVE3: 0
001042  000000                  HOLD:   0
001044  000000                  TSAVE:  0
001046  000000                  CNTR:   0
001050  000000                  CHANGE: 0
001052  000000                  LOKRB:  0



                        ;GS ADDRESSES AND INTERRUPT VECTORS

001054  172000                  DPC:    172000          ;DISPLAY PROGRAM COUNTER
001056  172002                  DSR:    172002          ;DISPLAY STATUS REGISTER
001060  172004                  XPOS:   172004          ;DISPLAY X AXIS REGISTER
001062  172006                  YPOS:   172006          ;DISPLAY Y AXIS REGISTER

001064  000320                  DDONE:  320             ;DISPLAY INTERRUPT VECTOR FOR STOP
001066  000322                  DDONE1: 322

001070  000324                  LPVCT:  324             ;DISPLAY INTERRUPT VECTOR FOR LIGHT-PEN
001072  000326                  LPVCT1: 326

001074  000330                  TIMEVT: 330             ;DISPLAY INTERRUPT VECTOR FOR TIME-OUT OR SHIFT-OUT
001076  000332                  TMEVT1: 332
```

```
                                        ;MONITOR ROUTINE
                                
001100  005737  002114          SCOPEA: TST     KRBD            ;TEST IF SW OR "KRB"
001104  001014                          BNE     SCOPEF          ;BR IF "KRB"
001106  005037  005624                  CLR     SWITCH          ;CLEAR "SWITCH"
001112  032777  000100  177052          BIT     #100,@SWR       ;TEST FOR "HOLD/STOP SWITCH"
001120  001402                          BEQ     SCOPEE          ;BR IF CLEARED
001122  005137  005624                  COM     SWITCH          ;SET SWITCH
001126  032777  000400  177036  SCOPEE: BIT     #400,@SWR       ;TEST BIT 8
001134  001010                          BNE     SCOPEB
001136  005737  001042          SCOPEF: TST     HOLD            ;TEST FOR "HOLD/STOP"
001142  001012                          BNE     SCOPED          ;BR IF SET
001144  000240                          NOP
001146  004737  001536                  JSR     PC,SETUP        ;RESET HOUSEKEEPING
001152  000240                          NOP
001154  000002                          RTI                     ;EXIT
001156  017704  177010          SCOPEB: MOV     @SWR,R4         ;READ SWITCHES
001162  042704  177760          SCOPEC: BIC     #177760,R4      ;MASK TO BITS 4-15
001166  006304                          ASL     R4              ;MOVE LEFT
001170  012706  000500          SCOPED: MOV     #STKPTR,SP      ;RESET STACK
001174  000240                          NOP
001176  004737  001536                  JSR     PC,SETUP        ;RESET HOUSEKEEPING
001202  000240                          NOP
001204  000174  001210                  JMP     @DISPTC(R4)     ;JMP TO THAT TEST

001210  002120          DISPTC: FILE0+2                 ;DIRECTORY
001212  002132                  FILE1+2                 ;DOT REPEATIBILITY
001214  002144                  FILE2+2                 ;PINCUSHION
001216  002410                  FILE3+2                 ;OCTAGONS OR SQUARES
001220  002464                  FILE4+2                 ;CHARACTER SET
001222  003074                  FILE5+2                 ;DASH LINES AND BLINK
001224  003106                  FILE6+2                 ;X VECTOR LENGTH
001226  003240                  FILE7+2                 ;Y VECTOR LENGTH
001230  003372                  FILE10+2                ;X PHOSPHOR TEST
001232  003446                  FILE11+2                ;Y PHOSPHOR TEST
001234  003522                  FILE12+2                ;INTENSITY LEVEL AND LIGHTPEN
001236  003664                  FILE13+2                ;EDGE SQUARES
001240  003576                  FILE14+2                ;SHORT VECTOR RELATIVE POINT TEST
001242  004156                  FILE15+2                ;GRAPHPLOT TEST
001244  004412                  FILE16+2                ;LIGHT-PEN FOLLOW
001246  005122                  FILE17+2                ;KEY BOARD ECHO
```

```
                                                LOWPWR: MOV     R0,-(SP)
                                                        MOV     R1,-(SP)
                                                        MOV     R2,-(SP)
                                                        MOV     R3,-(SP)
                                                        MOV     R4,-(SP)
                                                        MOV     R5,-(SP)
                                                        MOV     SP,LOWSV
                                                        MOV     #HIGPWR,@#24
                                                        HALT

                                                LOWSV:  0

                                                HIGPWR: MOV     LOWSV,SP
                                                        MOV     (SP)+,R5
                                                        MOV     (SP)+,R4
                                                        MOV     (SP)+,R3
                                                        MOV     (SP)+,R2
                                                        MOV     (SP)+,R1
                                                        MOV     (SP)+,R0
                                                        MOV     #LOWPWR,@#24
                                                        MOV     #STKPTR,SP
                                                        NOP
                                                        NOP
                                                        NOP
                                                        HALT
                                                        NOP
                                                        NOP
                                                        NOP
                                                        JMP     SCOPED
```

```
                                START:  MOV     #STKPTR,SP      ;SET UP THE STACK
001362  012777  000340  177420          MOV     #340,@PSW       ;RAISE PSW
001370  012700  001054                  MOV     #DPC,R0         ;GET POINTER
001374  013701  001000                  MOV     GSADD,R1        ;GET SUPPLIED ADDRESS
001400  010120                  STRA:   MOV     R1,(0)+         ;UPDATE
001402  062701  000002                  ADD     #2,R1           ;THE
001406  022700  001064                  CMP     #DPC+10,R0      ;ADDRESSES
001412  001372                          BNE     STRA            ;UNTIL DONE
001414  012700  001064                  MOV     #DDONE,R0       ;GET POINTER
001420  013701  001002                  MOV     GSVCT,R1        ;GET SUPPLIED VECTOR
001424  010120                  STRB:   MOV     R1,(0)+         ;UPDATE
001426  062701  000002                  ADD     #2,R1           ;THE VECTORS
001432  022700  001100                  CMP     #DDONE+14,R0
001436  001372                          BNE     STRB
001440  005037  005624                  CLR     SWITCH          ;HOUSEKEEP
001444  005037  001042                  CLR     HOLD            ;
001450  005004                          CLR     R4              ;
001452  005037  001044                  CLR     TSAVE           ;
001456  004737  001536          STRC:   JSR     PC,SETUP        ;SET UP VECTORS
001462  005037  001042                  CLR     HOLD
001466  012737  001000  012052          MOV     #1000,RAY14A    ;HOUSEKEEP X,Y ORIGIN FOR LIGHTPEN
001474  012737  000600  012054          MOV     #600,RAY14B
001502  012737  030060  012032          MOV     #30060,DLT14A   ;INITIALIZE X READOUT
001510  012737  030060  012034          MOV     #30060,DLT14A+2
001516  012737  030060  012044          MOV     #30060,DLT14B   ;INITIALIZE Y READOUT
001524  012737  030060  012046          MOV     #30060,DLT14B+2
001532  000137  002116                  JMP     FILEO           ;START THE TEST

001536  012737  000062  000060  SETUP:  MOV     #62,@#60        ;RESET KRB VECTOR
001544  012737  000000  000062          MOV     #0,@#62
001552  042777  000100  177232          BIC     #100,@TKS       ;CLEAR INT ENABLE
001560  005037  002114                  CLR     KRBD
001564  013746  000004                  MOV     @#ERRVEC,-(SP)  ;SAVE VECTOR CONTENTS
001570  012737  001616  000004          MOV     #1$,@#ERRVEC    ;SET UP FOR TRAP
001576  012737  177570  000172          MOV     #DSWR,@#SWR     ;SET UP TO TEST FOR SWITCH REGISTER
001604  022777  177777  176360          CMP     #-1,@SWR        ;TEST FOR SWITCH REGISTER
001612  001005                          BNE     3$              ;SWITCH REGISTER IS PRESENT
001614  000401                          BR      2$              ;NO SWITCH REGISTER
001616  022626                  1$:     CMP     (SP)+,(SP)+     ;POP 2 WORDS OFF STACK
001620  012737  000170  000172  2$:     MOV     #SWREG,@#SWR    ;SET UP FOR SOFTWARE SWITCH REGISTER
001626  012637  000004          3$:     MOV     (SP)+,@#ERRVEC  ;RESTORE VECTOR CONTENTS
001632  032777  000200  176332          BIT     #200,@SWR       ;TEST FOR "KRB" CONTROL
001640  001413                          BEQ     SETUPA          ;BR IF NOT
001642  005137  002114                  COM     KRBD            ;SET "KRB" CONTROL
001646  012737  001746  000060          MOV     #RETB,@#60      ;SET UP "KRB" INT
001654  012737  000340  000062          MOV     #340,@#62
001662  052777  000100  177122          BIS     #100,@TKS       ;ENABLE "KRB" INT
001670  012777  001732  177166  SETUPA: MOV     #SETUPB,@DDONE  ;SET UP GT DONE VECTOR
001676  012777  000340  177162          MOV     #340,@DDONE1
001704  013777  001072  177156          MOV     LPVCT1,@LPVCT   ;RESET LIGHT-PEN VECTOR
001712  005077  177154                  CLR     @LPVCT1
001716  013777  001076  177150          MOV     TMEVT1,@TIMEVT  ;RESET TIME-OUT/SHIFT OUT VECTOR
001724  005077  177146                  CLR     @TMEVT1
001730  000207                          RTS     PC              ;EXIT
```

```
                                                SETUPB: TST     @DSR            ;TEST FOR STOP
                                                        BMI     .+4
                                                        HALT                    ;ERROR, INTERRUPT OCCURRED TO THE STOP
                                                                                ;VECTOR BUT STOP WAS NOT SET
                                                        RTI
                                                        HALT

                                                RETB:   MOVB    @TKB,TSAVE      ;READ THE CHARACTER
                                                        BIC     #177600,TSAVE   ;MASK TO 7 BITS
                                                        CMP     #15,TSAVE       ;TEST FOR "CR"
                                                        BEQ     KYT3            ;BR IF
                                                        CLR     SWITCH          ;CLEAR "SWITCH"
                                                        SUB     #101,TSAVE      ;MAKE 0-77
                                                KYT5:   BMI     KYT1            ;<A
                                                        CMP     #17,TSAVE
                                                        BMI     KYT2            ;>P
                                                        MOV     TSAVE,R4
                                                        MOV     #-1,CHANGE
                                                        CLR     SWITCH
                                                        CLR     HOLD
                                                        RTI                     ;EXIT
                                                KYT2:   CMP     #76,TSAVE
                                                        BNE     KYT4
                                                        MOV     #-1,HOLD        ; RUBOUT
                                                        RTI                     ;EXIT
                                                KYT1:   CLR     HOLD
                                                        RTI
                                                        HALT                    ;FATAL ERROR RTI FAILED

                                                KYT3:   MOV     #-1,SWITCH
                                                        RTI
                                                        HALT                    ;FATAL ERROR, RTI FAILED

                                                KYT4:   SUB     #40,TSAVE       ;CONVERT LC TO UC
                                                        BR      KYT5
                                                KRBD:   0
```

```
                                        .LIST
                                ;EXECUTE DIRECTORY FRAME
                                
002116  104000          FILED:  SCOPE
002120  004537  005460          JSR     5,MESG          ;EXIT TO DISPLAY A FRAME
002124  001000                  1000
002126  005626                  FRMED                   ;USING THE DIR. FRAME
                                
                                ;EXECUTE DOT REPEATIBILITY FRAME
                                
002130  104000          FILE1:  SCOPE
002132  004537  005460          JSR     5,MESG          ;EXIT TO DISPLAY A FRAME
002136  100000                  100000
002140  007206                  FRME1                   ;USING THE DOR REPEAT FRAME
                                
                                ;EXECUTE PINCUSHION FRAME
                                
002142  104000          FILE2:  SCOPE
002144  012700  012536          MOV     #BUFFER,R0              ;LOAD START ADDRESS
002150  004737  002320          JSR     PC,SETPNT               ;LOAD 0,0 ORGIN
002154  012701  000020          MOV     #20,R1                  ;SETUP COUNT
002160  012720  040000  1$:     MOV     #INTX,(R0)+             ;LOAD INT LINE
002164  012720  001777          MOV     #MAXY,(R0)+             ; MAX Y
002170  012720  000100          MOV     #100,(R0)+              ;LOAD DELTA X
002174  012720  021777          MOV     #MINUSX+MAXY,(R0)+      ;LOAD - MAX Y
002200  005301                  DEC     R1                      ;FINISHED ?
002202  001366                  BNE     1$                      ;BR IF NOT
002204  012720  020001          MOV     #MINUSX+1,(R0)+         ;GO BACK 1 UNIT
002210  012720  000000          MOV     #0,(R0)+
002214  012720  040000          MOV     #INTX,(R0)+
002220  012720  001777          MOV     #MAXY,(R0)+             ;PLOT LAST LINE
002224  004737  002320          JSR     PC,SETPNT               ;SET ORGIN
002230  012701  000020          MOV     #MAXY+1/100,R1          ;SETUP COUNT
002234  012720  041777  2$:     MOV     #INTX+MAXX,(R0)+        ;LOAD DELTA X MAX
002240  012720  000000          MOV     #0,(R0)+                ;LOAD DELTA Y = 0
002244  012720  021777          MOV     #MINUSX+MAXX,(R0)+      ;RETRACE
002250  012720  000100          MOV     #100,(R0)+              ;LOAD DELTA Y OF 100
002254  005301                  DEC     R1                      ;FINISHED ?
002256  001366                  BNE     2$                      ;BR IF NOT
002260  012720  000000          MOV     #0,(R0)+
002264  012720  020001          MOV     #MINUSX+1,(R0)+
002270  012720  041777          MOV     #INTX+MAXX,(R0)+        ;PLOT LAST LINE
002274  012720  000000          MOV     #0,(R0)+
002300  012720  173400          MOV     #DSTOP,(R0)+            ;LOAD STOP
002304  012720  160000          MOV     #DJMP,(R0)+             ;LOAD JUMP
002310  012710  012536          MOV     #BUFFER,(R0)
002314  000137  002342          JMP     FILE2A
                                
002320  012720  117000  SETPNT: MOV     #POINT!INT4,(R0)+               ;LOAD POINT
002324  012720  000000          MOV     #0,(R0)+                        ; AT X
002330  012720  000000          MOV     #0,(R0)+                        ; AT Y
002334  012720  110000          MOV     #LONGV,(R0)+                    ;LONG VECTOR
002340  000207                  RTS     PC                              ;EXIT
```

```
                                ;EXECUTE OCTAGONS OR SQUARES
```

```
                                        ;DISPLAY FILE
                                        ;CHARACTER AND ITALICS TEST
                                        ;SET UP THE BUFFER FOR THIS TEST

002462  104000                  FILE4:  SCOPE
002464  012700  012536                  MOV     #BUFFER,R0
002470  012720  174400                  MOV     #STATSB!SIZED,(0)+
002474  012720  170052                  MOV     #STATSA!ITALO!SYNOFF!GREEN,(0)+
002500  012720  117124                  MOV     #POINT!INT4!LPOFF!BLKOFF!LINE0,(0)+     ;LOAD POINT MODE
002504  012720  000000                  MOV     #0,(0)+
002510  012720  001700                  MOV     #MAXY-77,(0)+
002514  012720  100000                  MOV     #CHAR,(0)+
002520  112720  000017                  MOVB    #17,(0)+
002524  112720  000017                  MOVB    #17,(0)+
002530  012737  000100  002734          MOV     #100,STCHAR             ;LOAD INITIAL CHAR.
002536  004737  002672                  JSR     PC,LOADBF
002542  012737  000140  002734          MOV     #140,STCHAR             ;LOAD INITIAL LC CHAR
002550  004737  002672                  JSR     PC,LOADBF               ;LOAD LINE
002554  012737  000040  002734          MOV     #40,STCHAR              ;LOAD NUMBERS AND PUNCT
002562  004737  002672                  JSR     PC,LOADBF               ;LOAD LINE
002566  012720  170040                  MOV     #STATSA!ITALO,(R0)+     ;LOAD NORMAL FONT
002572  004737  002632                  JSR     PC,LOADSP               ;LOAD SPECIAL CHARS
002576  004737  002776                  JSR     PC,SPACE                ;INSERT SPACES
002602  012720  170060                  MOV     #STATSA!ITAL1,(R0)+     ;LOAD ITALICS FONT
002606  004737  002632                  JSR     PC,LOADSP               ;LOAD SPIECAL
002612  012720  173400                  MOV     #DSTOP,(R0)+            ;LOAD DSTOP
002616  012720  160000                  MOV     #DJMP,(R0)+
002622  012720  012536                  MOV     #BUFFER,(R0)+
002626  000137  003014                  JMP     FILE4A

002632  112720  000016          LOADSP: MOVB    #16,(R0)+
002636  012702  000000                  MOV     #0,R2                   ;SET INITIAL SHIFT OUT CHAR
002642  012703  000037                  MOV     #37,R3                  ;LOAD COUNT
002646  110220                  1$:     MOVB    R2,(R0)+                ;LOAD CHAR
002650  005202                  2$:     INC     R2
002652  022702  000017                  CMP     #17,R2                  ;TEST FOR SI
002656  001774                          BEQ     2$                      ;BR IF SI "17"
002660  005303                          DEC     R3                      ;FINISHED ?
002662  001371                          BNE     1$                      ;BR IF NOT
002664  012720  020017                  MOV     #20017,(R0)+            ;LOAD SHIFT-IN SPACE
002670  000207                          RTS     PC                      ;EXIT

002672  012720  170040          LOADBF: MOV     #STATSA!ITALO,(R0)+     ;LOAD NORMAL FONT
002676  013702  002734                  MOV     STCHAR,R2               ;GET STARTING CHAR
002702  004737  002760                  JSR     PC,FILLIT               ;LOAD THE CHARACTERS
002706  004737  002776                  JSR     PC,SPACE                ;INSERT SPACES
002712  012720  170060                  MOV     #STATSA!ITAL1,(R0)+     ;LOAD ITALICS FONT
002716  013702  002734                  MOV     STCHAR,R2               ;GET STARTING CHARACTER
002722  004737  002760                  JSR     PC,FILLIT               ;LOAD THE CHARACTERS
002726  004737  002736                  JSR     PC,CRLF                 ;INSERT CR-LF
002732  000207                          RTS     PC                      ;EXIT

002734  000000          STCHAR: 0

002736  112720  000015          CRLF:   MOVB    #15,(0)+
```

```
  751  002742  112720  000012              MOVB    #12,(0)+
  752  002746  112720  000015              MOVB    #12,(0)+
  753  002752  112720  000012              MOVB    #12,(0)+
  754  002756  000207                      RTS     PC                      ;EXIT
  755
  756  002760  012703  000040    FILLIT:   MOV     #40,R3
  757  002764  110220             FILLA:   MOVB    R2,(0)+
  758  002766  005202                      INC     R2
  759  002770  005303                      DEC     R3
  760  002772  001374                      BNE     FILLA
  761  002774  000207                      RTS     7
  762
  763  002776  012703  000010    SPACE:    MOV     #10,R3
  764  003002  112720  000040    1$:       MOVB    #40,(R0)+               ;LOAD A SPACE
  765  003006  005303                      DEC     R3
  766  003010  001374                      BNE     1$                      ;BR IF NOT DONE
  767  003012  000207                      RTS     PC                      ;EXIT
  768
  769                          ;ACTUAL DISPLAY ROUTINE
  770
  771  003014  012737  001000  003070 FILE4A: MOV     #1000.,10$              ;LOAD A COUNTER
  772  003022  012737  001700  012546 4$:     MOV     #MAXY-77,BUFFER+10      ;LOAD STARTING POINT
  773  003030  004537  005460                JSR     R5,MESG
  774  003034  000001                        1
  775  003036  012536                        BUFFER
  776
  777  003040  012737  000400  012546        MOV     #400,BUFFER+10
  778  003046  004537  005460                JSR     R5,MESG
  779  003052  000001                        1
  780  003054  012536                        BUFFER
  781
  782  003056  005337  003070                DEC     10$                     ;FINISHED ?
  783  003062  001357                        BNE     4$                      ;BR IF NOT
  784  003064  000137  003072                JMP     FILE5                   ;GO TO NEXT TEST
  785
  786  003070  000000             10$:      0
  787
  788                          ;EXECUTE DASH LINES AND BLINK
  789
  790  003072  104000             FILE5:    SCOPE
  791  003074  004537  005460                JSR     5,MESG          ;EXIT TO DISPLAY A FRAME
  792  003100  010000                        10000
  793  003102  010242                        FRME5                   ;USING THE DASH AND BLINK FRAME
```

```
                                        ;EXECUTE VECTOR LENGTH TEST (HORIZ)

003104  104000                  FILE6:  SCOPE
003106  012737  041777  010540          MOV     #INTX!MAXX,DELTX6 ;SET UP VERTICAL HEIGHT
003114  012737  000010  001036          MOV     #10,DSAVE2        ;SET UP TIMER
003122  012737  000000  001034          MOV     #0,DSAVE1
003130  012737  000040  001046  LOOPA:  MOV     #40,CNTR          ;SET UP EXECUTION COUNT
003136  012737  000200  001032  LOOPA1: MOV     #MAXY+1/10,DSAVE  ;SET UP
003144  013737  001034  010542          MOV     DSAVE1,DELTY6
003152  004537  005460                  JSR     5,MESG            ;EXIT TO DISPLAY FRAME
003156  000001                          1
003160  010474                          FRME6                     ;VECTOR LENGTH FRAME
003162  004537  005460          LOOPA2: JSR     5,MESG            ;EXIT TO DISPLAY FRAME
003166  000001                          1
003170  010530                          FRME6A                    ;VECTOR LENGTH FRAME
003172  062737  000010  010542          ADD     #10,DELTY6        ;UPDATE ANGLE
003200  005337  001032                  DEC     DSAVE             ;FINISHED ALL THE ANGLES
003204  001366                          BNE     LOOPA2            ;BR IF NOT
003206  005337  001046          LOOPA3: DEC     CNTR              ;DONE COUNT?
003212  001351                          BNE     LOOPA1            ;BR IF NOT
003214  000240                          NOP
003216  005737  005624                  TST     SWITCH            ;TEST SWITCH
003222  001342                          BNE     LOOPA             ;BR IF HALT MOTION
003224  005237  001034                  INC     DSAVE1            ;UPDATE INITIAL ANGLE
003230  005337  001036                  DEC     DSAVE2            ;FINISHED ALL?
003234  001335                          BNE     LOOPA             ;BR IF NOT

                                        ;EXECUTE VECTOR LENGTH TEST (VERT)

003236  104000                  FILE7:  SCOPE
003240  012737  040000  001034          MOV     #INTX,DSAVE1      ;SETUP INITIAL X
003246  012737  001777  010542          MOV     #MAXY,DELTY6      ;SETUP INITIAL Y
003254  012737  000010  001036          MOV     #10,DSAVE2        ;SETUP EXECUTION COUNT
003262  012737  000040  001046  LOOPB:  MOV     #40,CNTR          ;SETUP DELAY
003270  012737  000200  001032  LOOPB1: MOV     #200,DSAVE
003276  013737  001034  010540          MOV     DSAVE1,DELTX6     ;EXIT TO DISPLAY FRAME
003304  004537  005460                  JSR     5,MESG            ;VECTOR LENGTH TEST FRAME
003310  000001                          1
003312  010474                          FRME6
003314  004537  005460          LOOPB2: JSR     5,MESG            ;EXIT TO DISPLAY FRAME
003320  000001                          1
003322  010530                          FRME6A                    ;VECTOR LENGTH FRAME
003324  062737  000010  010540          ADD     #10,DELTX6        ;UPDATE ANGLE
003332  005337  001032                  DEC     DSAVE             ;FINISHED ALL THE ANGLES
003336  001366                          BNE     LOOPB2            ;BR IF NOT
003340  005337  001046          LOOPB3: DEC     CNTR              ;DONE COUNT?
003344  001351                          BNE     LOOPB1            ;BR IF NOT
003346  000240                          NOP
003350  005737  005624                  TST     SWITCH            ;TEST SWITCH
003354  001342                          BNE     LOOPB             ;BR IF HALT MOTION
003356  005237  001034                  INC     DSAVE1            ;UPDATE INITIAL ANGLE
003362  005337  001036                  DEC     DSAVE2            ;FINISHED ALL?
003366  001335                          BNE     LOOPB             ;BR IF NOT
```

```
 848
 849                                    ;PHOSPHOR TEST (HORIZONTAL)
 850
 851  003370  104000                    FILE10: SCOPE
 852  003372  005037  010554                    CLR     DELTX7
 853  003376  004537  005460            D7A:    JSR     5,MESG          ;EXIT TO DISPLAY A FRAME
 854  003402  000050                            50
 855  003404  010552                            FRME10                  ;USING THE HORIZ FRAME
 856  003406  004537  005460                    JSR     5,MESG          ;EXIT TO DISPLAY A FRAME
 857  003412  000001                            1
 858  003414  010652                            FRM10                   ;USING THE PERIMETER BOX
 859  003416  000240                            NOP
 860  003420  005737  005624                    TST     SWITCH          ;TEST THE "SWITCH"
 861  003424  001364                            BNE     D7A             ;BR IF FREEZE THE MOVEMENT
 862  003426  062737  000001  010554  D7C:      ADD     #1,DELTX7       ;UPDATE THE X ORIGIN
 863  003434  022737  002000  010554            CMP     #2000,DELTX7    ;TEST IF THE END
 864  003442  001355                            BNE     D7A             ;BR IF NOT
 865
 866                                    ;PHOSPHOR TEST  (VERTICAL)
 867
 868  003444  104000                    FILE11: SCOPE
 869  003446  005037  010616                    CLR     DELTY7
 870  003452  004537  005460            D7D:    JSR     5,MESG          ;EXIT TO DISPLAY A FRAME
 871  003456  000050                            50
 872  003460  010612                            FRME11                  ;USING THE VERT FRAME
 873  003462  004537  005460                    JSR     5,MESG          ;EXIT TO DISPLAY A FRAME
 874  003466  000001                            1
 875  003470  010652                            FRM10                   ;USING THE PERIMETER BOX
 876  003472  000240                            NOP
 877  003474  005737  005624                    TST     SWITCH          ;TEST THE "SWITCH"
 878  003500  001364                            BNE     D7D             ;BR IF FREEZE THE MOVEMENT
 879  003502  062737  000001  010616  D7F:      ADD     #1,DELTY7       ;UPDATE THE Y ORIGIN
 880  003510  022737  002000  010616            CMP     #MAXY+1,DELTY7  ;TEST IF THE END
 881  003516  001355                            BNE     D7D             ;BR IF NOT
 882
```

```
                                        ;INTENSITY LEVEL TEST
                                        
003520  104000                  FILE12: SCOPE
003522  012777  003616  175340          MOV     #RETLP,@LPVCT   ;SET UP LIGHT-PEN VECTOR
003530  013777  001004  175334          MOV     GSBRL,@LPVCT1   ;SET UP BR LEVEL
003536  012737  004000  001032          MOV     #4000,DSAVE     ;SET UP A EXECUTION COUNT
003544  005737  005624          FLE12A: TST     SWITCH          ;TEST THE "SWITCH"
003550  001004                          BNE     FLE12B          ;BR IF SET "SYNC"
003552  042737  000004  010716          BIC     #4,SYN12        ;ENSURE CLEAR "SYNC"
003560  000403                          BR      FLE12C          ;BY PASS
003562  052737  000004  010716  FLE12B: BIS     #4,SYN12        ;SET THE "SYNC"
003570  004537  005460          FLE12C: JSR     5,MESG          ;EXIT TO DISPLAY FRAME
003574  000001                          1
003576  010710                          FRME12                  ;USING THE "INTENSITY" FRAME
003600  005337  001032                  DEC     DSAVE           ;FINISHED?
003604  001423                          BEQ     FLE12D          ;YES, EXIT
003606  012737  173400  011316          MOV     #DSTOP,RAYLPA   ;NO, RESET MESSAGE
003614  000753                          BR      FLE12A          ;BR BACK
003616  012737  164000  011316  RETLP: MOV     #DNOP,RAYLPA    ;LIGHT-PEN HIT
003624  017737  175232  011330          MOV     @YPOS,LPPNT     ;READ Y POSITION
003632  042737  176000  011330          BIC     #176000,LPPNT   ;MASK THE BITS
003640  022626                          CMP     (SP)+,(SP)+     ;POP THE STACK
003642  012777  000001  175204          MOV     #1,@DPC         ;SINGLE STEP THE DISPLAY
003650  000137  005476                  JMP     MESGA           ;JUMP TO WAIT
003654  013777  001072  175206  FLE12D: MOV     LPVCT1,@LPVCT   ;RESET THE LIGHT-PEN VECTOR
                                        
                                        
                                        ;EXECUTE EDGE TEST
                                        
003662  104000                  FILE13: SCOPE
003664  004537  005460                  JSR     5,MESG          ;EXIT TO DISPLAY FRAME
003670  010000                          10000
003672  011360                          FRME13                  ;USING THE "EDGE" FRAME
```

```
                                        ;SHORT VECTOR AND RELATIVE POINT TEST
                                        
003674  104000                  FILE14: SCOPE
003676  012700  012536                  MOV     #BUFFER,R0      ;SET UP R0
003702  012720  114000                  MOV     #POINT,(0)+     ;SET UP INITIAL
003706  012720  000240                  MOV     #240,(0)+       ;X POSITION
003712  012720  001000                  MOV     #MAXY+1/2,(0)+  ;Y POSITION
003716  012720  107004                  MOV     #SHORTV!INT4!LINE0,(0)+ ;LOAD "SHORT VECTOR"
003722  004737  003754                  JSR     PC,LOADVT       ;LOAD THE DISPLAY PATTERN
003726  012720  130000                  MOV     #RELATV,(0)+    ;LOAD "RELATIVE POINT"
003732  004737  003754                  JSR     PC,LOADVT       ;LOAD THE DISPLAY PATTERN
003736  012720  173400                  MOV     #DSTOP,(0)+     ;LOAD "DISPLAY STOP"
003742  012720  160000                  MOV     #DJMP,(0)+      ;LOAD "DISPLAY JUMP"
003746  012720  012536                  MOV     #BUFFER,(0)+    ;TO THE BUFFER ADDRESS
003752  000413                          BR      FIL14A          ;BR TO THE FRAME
                                        
003754  012737  000024  001046 LOADVT: MOV     #24,CNTR        ;LOAD A COUNTER
003762  012720  040077         LADVT:  MOV     #INTX+77,(0)+   ;LOAD A DELTA Y
003766  012720  004177                  MOV     #4177,(0)+      ;LOAD A DELTA X,Y
003772  005337  001046                  DEC     CNTR            ;FINISHED?
003776  001371                          BNE     LADVT           ;BR IF NOT
004000  000207                          RTS     PC              ;EXIT
                                        
004002  012737  004000  004152 FIL14A: MOV     #4000,10$               ;LOAD COUNTER
004010  012737  000200  011640 1$:     MOV     #200,FRM14A             ;LOAD FIRST OCTAGON
004016  012737  000200  011642         MOV     #200,FRM14B
004024  004537  005460                  JSR     R5,MESG                 ;DISPLAY OCT.
004030  000001                          1
004032  011634                          FRME14
004034  012737  001400  011640         MOV     #1400,FRM14A            ;LOAD SECOND OCTAGON
004042  012737  000200  011642         MOV     #200,FRM14B
004050  004537  005460                  JSR     R5,MESG                 ;DISPLAY 2ND OCT.
004054  000001                          1
004056  011634                          FRME14
004060  012737  001400  011640         MOV     #1400,FRM14A            ;LOAD THIRD OCTAGON
004066  012737  001400  011642         MOV     #MAXY-377,FRM14B
004074  004537  005460                  JSR     R5,MESG
004100  000001                          1
004102  011634                          FRME14
004104  012737  000200  011640         MOV     #200,FRM14A             ;LOAD FOURTH OCTAGON
004112  012737  001400  011642         MOV     #MAXY-377,FRM14B
004120  004537  005460                  JSR     R5,MESG                 ;DISPLAY 4TH OCT.
004124  000001                          1
004126  011634                          FRME14
004130  004537  005460                  JSR     R5,MESG                 ;DISPLAY BAR
004134  000001                          1
004136  012536                          BUFFER
004140  005337  004152                  DEC     10$                     ;FINISHED ?
004144  001321                          BNE     1$                      ;BR IF NOT
004146  000137  004154                  JMP     FILE15                  ;NEXT TEST
004152  000000                  10$:    0
```

```
                                        ;GRAPHPLOT X-Y TEST
                                        
004154  104000                  FILE15: SCOPE
004156  012700  012536                  MOV     #BUFFER,R0      ;LOAD R0
004162  012720  117600                  MOV     #POINT!INT7,(0)+ ;LOAD INITIAL POINT
004166  012720  000000                  MOV     #0,(0)+
004172  012720  000000                  MOV     #0,(0)+
004176  012720  170052                  MOV     #STATSA!ITALO!SYNOFF!GREEN,(R0)+ ;RESET THE STATUS A
004202  012720  174100                  MOV     #STATSB!INCR,(0)+ ;LOAD INITIAL STATUS B
004206  012720  120000                  MOV     #GRAPHX,(0)+    ;LOAD GRAPH X INST
004212  012705  000040          DFL15C: MOV     #40,R5          ;LOAD STARTUP COUNT
004216  012737  000000  001032          MOV     #0,DSAVE        ;LOAD INITIAL PLOT
004224  000403                          BR      2$
004226  062737  000020  001032  1$:     ADD     #20,DSAVE       ;UPDATE PLOT POINT
004234  013720  001032          2$:     MOV     DSAVE,(0)+      ;SAVE THE POINT
004240  005305                          DEC     R5              ;FINISHED?
004242  001371                          BNE     1$              ;BR IF NOT
004244  012720  173400                  MOV     #DSTOP,(0)+     ;LOAD "DSTOP"
004250  012720  160000                  MOV     #DJMP,(0)+      ;LOAD "DJMP"
004254  012720  012536                  MOV     #BUFFER,(0)+    ;LOAD RETURN
004260  012737  000200  001032          MOV     #200,DSAVE      ;LOAD POINT COUNT
004266  042777  004000  174534  DFL15D: BIC     #4000,@DBUF5    ;ENSURE "GRAPHX"
004274  005737  005624                  TST     SWITCH          ;TEST SWITCH
004300  001403                          BEQ     DFL15B          ;BR IF GRAPHX
004302  052777  004000  174520          BIS     #4000,@DBUF5    ;SET GRAPHY
004310  004537  005460          DFL15B: JSR     5,MESG          ;EXIT TO DISPLAY A FRAME
004314  000001                          1
004316  012536                          BUFFER                  ;USING THE GENERATED PATTERN
004320  062777  000001  174500          ADD     #1,@DBUF4       ;UPDATE INCREMENT
004326  022777  174200  174472          CMP     #STATSB+200,@DBUF4 ;TEST IF LAST INCREMENT
004334  001365                          BNE     DFL15B          ;BR IF NOT
004336  012777  174100  174462          MOV     #STATSB!INCR,@DBUF4 ;RELOAD INCREMENT
004344  005337  001032                  DEC     DSAVE           ;FINISHED 10 SEC?
004350  001346                          BNE     DFL15D          ;BR IF NOT

004352  013700  000042                  MOV     @#42,R0
004356  001407                          BEQ     HERE                            ;ACT-11/DDP-11
004360  000005                          RESET
004362  000005                          RESET
004364  004710                  LOGICAL:        JSR     PC,(R0)
004366  000240                          NOP
004370  000240                          NOP
004372  000240                          NOP
004374  000240                          NOP
004376  000137  002116          HERE:   JMP     FILE0
004402  000240                          NOP
004404  000240                          NOP
004406  000240                          NOP
```

```
1019
1020                                    ;OPERATOR OPERATOR INTERVENTION TESTS
1021
1022  004410  104000                    FILE16: SCOPE
1023  004412  012777  004662  174450            MOV     #RET14,@LPVCT
1024  004420  013777  001004  174444            MOV     GSBRL,@LPVCT1
1025  004426  012737  000100  001034            MOV     #100,DSAVE1             ;SET UP COUNT
1026  004434  012700  012536            1$:     MOV     #BUFFER,R0              ;LOAD START ADDR.
1027  004440  012737  000100  001032            MOV     #100,DSAVE
1028  004446  012720  117744                    MOV     #POINT!INT7!LPON!LINE0,(R0)+    ;LOAD POINT
1029  004452  012720  000700                    MOV     #700,(R0)+              ;LOAD X POINT
1030  004456  012720  000474                    MOV     #474,(R0)+              ;LOAD Y POINT
1031  004462  004737  004624                    JSR     PC,LOADUP               ;LOAD UP THE BUFFER
1032  004466  012720  173400                    MOV     #DSTOP,(R0)+            ;LOAD DSTOP
1033  004472  012720  160000                    MOV     #DJMP,(R0)+             ;LOAD DJUMP
1034  004476  012720  012536                    MOV     #BUFFER,(R0)+           ;LOAD RETURN ADDRESS
1035  004502  005037  005116                    CLR     HITCNT                  ;CLEAR HIT COUNT
1036  004506  012737  030060  012442            MOV     #30060,FRM16B-2         ;PRESET THE READOUT
1037  004514  012737  030060  012440            MOV     #30060,FRM16B-4
1038
1039  004522  005737  005624            4$:     TST     SWITCH                  ;TEST SWITCH BIT
1040  004526  001005                            BNE     6$              ;BR IF SUBTEST
1041
1042  004530  004537  005460                    JSR     R5,MESG                 ;EXIT TO DISPLAY FRAME
1043  004534  000100                            100
1044  004536  011762                            FRME16                          ;USINT THE LIGHT-PEN FRAME
1045  004540  000770                            BR      4$                      ;BR BACK
1046
1047  004542  004537  005460            6$:     JSR     R5,MESG                 ;EXIT TO DISPLAY FRAME
1048  004546  000001                            1
1049  004550  012350                            FRM16A                          ;ASCII SUBTITLE
1050
1051  004552  004537  005460                    JSR     R5,MESG                 ;EXIT TO DISPLAY FRAME
1052  004556  000001                            1
1053  004560  012536                            BUFFER
1054
1055
1056  004562  005337  001032                    DEC     DSAVE                   ;FINISHED ?
1057  004566  001355                            BNE     4$                      ;BR IF NOT MINI-LOOP
1058
1059  004570  005337  001034                    DEC     DSAVE1                  ;FINISHED ?
1060  004574  001317                            BNE     1$                      ;BR IF NOT
1061  004576  000137  004410                    JMP     FILE16                  ;RESTART
1062
```

```
1063
1064  004602  012701  000030          LOADAC: MOV     #24.,R1                 ;LOAD COUNT
1065  004606  012720  130000                  MOV     #RELATV,(R0)+           ;LOAD RELATIVE POINT
1066  004612  012720  040004          1$:     MOV     #INTX+4,(R0)+           ;LOAD INTEN BIT
1067  004616  005301                          DEC     R1                      ;FINISHED ?
1068  004620  001374                          BNE     1$                      ;BR IF NOT
1069  004622  000207                          RTS     PC                      ;EXIT
1070
1071  004624  012737  000030  001046  LOADUP: MOV     #24.,CNTR                       ;LOAD COUNT
1072  004632  004737  004602          1$:     JSR     PC,LOADAC               ;LOAD ACCROSS
1073  004636  012720  110000                  MOV     #LONGV,(R0)+            ;LOAD LONG VECTOR
1074  004642  012720  000004                  MOV     #4,(R0)+                ;LOAD VECTOR OVER
1075  004646  012720  020140                  MOV     #MINUSX+140,(R0)+               ;AND UP
1076  004652  005337  001046                  DEC     CNTR
1077  004656  001365                          BNE     1$                      ;BR IF NOT DONE
1078  004660  000207                          RTS     PC                      ;EXIT
1079
1080
1081  004662  017737  174174  005022  RET14:  MOV     @YPOS,40$
1082  004670  042737  176000  005022          BIC     #176000,40$
1083  004676  017737  174156  005024          MOV     @XPOS,41$
1084  004704  042737  176000  005024          BIC     #176000,41$
1085  004712  005737  005624                  TST     SWITCH          ;TEST SW
1086  004716  001411                          BEQ     1$              ;BR IF LIGHT PEN FOLLOW
1087  004720  005237  005116                  INC     HITCNT          ;UPDATE LIGHT PEN HIT COUNT
1088  004724  013703  005116                  MOV     HITCNT,R3       ;LOAD R3
1089  004730  012702  012444                  MOV     #FRM16B,R2      ;LOAD ADDRESS
1090  004734  004737  005400                  JSR     PC,KBCHR        ;CONVERT OCTAL
1091  004740  000432                          BR      20$             ;BR
1092  004742  013703  005024          1$:     MOV     41$,R3          ;LOAD R3
1093  004746  012702  012036                  MOV     #DLT14A+4,R2    ;LOAD ADDRESS
1094  004752  004737  005400                  JSR     PC,KBCHR        ;LOAD X READOUT
1095  004756  013703  005022                  MOV     40$,R3          ;LOAD R3
1096  004762  012702  012050                  MOV     #DLT14B+4,R2    ;LOAD ADDRESS
1097  004766  004737  005400                  JSR     PC,KBCHR        ;LOAD Y READOUT
1098  004772  013737  005022  012054          MOV     40$,RAY14B      ;LOAD NEW Y POSITION
1099  005000  013737  005024  012052          MOV     41$,RAY14A      ;LOAD NEW X POSITION
1100  005006                          10$:
1101  005006  012777  000001  174040          MOV     #1,@DPC         ;SINGLE STEP THE DISPLAY
1102  005014  022626                          CMP     (SP)+,(SP)+
1103  005016  000137  005476                  JMP     MESGA
1104
1105  005022  000000          40$:    0
1106  005024  000000          41$:    0
1107
```

```
1108
1109  005026  005001                    20$:    CLR     R1
1110  005030  005002                            CLR     R2
1111  005032  013700  005024                    MOV     41$,R0          ;GET X AXIS
1112  005036  162700  000700                    SUB     #700,R0         ;GET A BASE ADDRESS
1113  005042  006200                            ASR     R0
1114  005044  006200                            ASR     R0
1115  005046  001404                            BEQ     30$
1116  005050  062701  000070            21$:    ADD     #70,R1          ;UPDATE OFFSET
1117  005054  005300                            DEC     R0
1118  005056  001374                            BNE     21$             ;BR UNTIL DONE
1119
1120  005060  013700  005022            30$:    MOV     40$,R0          ;GET X AXIS
1121  005064  162700  000500                    SUB     #500,R0         ;MAKE BASE ADDRESS
1122  005070  006200                            ASR     R0
1123  005072  006200                            ASR     R0              ;SHIFT RIGHT
1124  005074  001404                            BEQ     32$
1125  005076  062701  000002            31$:    ADD     #2,R1
1126  005102  005300                            DEC     R0
1127  005104  001374                            BNE     31$
1128  005106  042761  040000  012546    32$:    BIC     #INTX,BUFFER+10(R1)     ;CLEAR THE BIT
1129  005114  000734                            BR      10$
1130
1131  005116  000000                    HITCNT: 0
```

```
1132                                        ;ECHO ROUTINE KEYBOARD TO DISPLAY
1133
1134  005120  104000                FILE17: SCOPE
1135  005122  012700  012536               MOV     #BUFFER,R0          ;LOAD R0
1136  005126  012720  173400       ECHOA:  MOV     #DSTOP,(0)+         ;MOV "DSTOPS"
1137  005132  022700  013536               CMP     #BUFFER+1000,R0     ;THRUOUT THE
1138  005136  001373                       BNE     ECHOA               ;BUFFER
1139  005140  005037  001052               CLR     LOKRB               ;HOUSE
1140  005144  005037  001032               CLR     DSAVE               ;KEEPING
1141  005150  112737  000060  012527       MOVB    #60,KBOCT-4
1142  005156  112737  000060  012530       MOVB    #60,KBOCT-3                 ;PRESET READOUT
1143  005164  112737  000060  012531       MOVB    #60,KBOCT-2
1144  005172  112737  000060  012532       MOVB    #60,KBOCT-1
1145  005200  012737  005254  000060       MOV     #RET117,@#60        ;LOAD KEYBOARD VECTOR
1146  005206  012737  000340  000062       MOV     #340,@#62
1147  005214  052777  000100  173570       BIS     #100,@TKS           ;ENABLE INTERRUPT
1148  005222  012737  000700  005376       MOV     #700,CHRCNT         ;LOAD CHAR COUNT
1149  005230  012700  012536               MOV     #BUFFER,R0          ;RESET R0
1150  005234  004537  005460       ECHOC:  JSR     5,MESG              ;EXIT TO DISPLAY A FRAME
1151  005240  000001                       1
1152  005242  012452                       FRME17                      ;USING THE KEYBOARD HEADER
1153  005244  005737  001052               TST     LOKRB               ;UPDATE A CHAR?
1154  005250  001012                       BNE     RET21               ;BR IF YES
1155  005252  000770                       BR      ECHOC
1156  005254  017701  173534       RET117: MOV     @TKB,R1             ;GET A CHAR
1157  005260  042701  177600               BIC     #177600,R1          ;MASK
1158  005264  012737  177777  001052       MOV     #-1,LOKRB           ;SET (FLAG)
1159  005272  000002                       RTI                         ;EXIT
1160  005274  000000                       HALT
1161  005276  005037  001052       RET21:  CLR     LOKRB               ;CLEAR (FLAG)
1162  005302  022701  000003               CMP     #3,R1               ;TEST FOR PC
1163  005306  001002                       BNE     RET20               ;BR IF NOT
1164  005310  000137  001456               JMP     STRC                ;RESTART
1165  005314  005337  005376       RET20:  DEC     CHRCNT              ;FINISHED COUNT?
1166  005320  001002                       BNE     1$                  ;BR IF NOT
1167  005322  000137  005122               JMP     FILE17+2            ;RESTART
1168  005326  012702  012533       1$:     MOV     #KBOCT,R2                   ;LOAD ADDRESS
1169  005332  010103                       MOV     R1,R3
1170  005334  004737  005400               JSR     PC,KBCHR                    ;LOAD THE OCTAL VALUE
1171  005340  005737  001032               TST     DSAVE               ;TEST HIGH/LOW BYTE
1172  005344  001007                       BNE     ECHOB
1173  005346  110120                       MOVB    R1,(R0)+            ;SAVE BYTE
1174  005350  112710  000017               MOVB    #17,(R0)            ;SHIFT-IN
1175  005354  005137  001032               COM     DSAVE               ;COMP FLAG
1176  005360  000137  005234               JMP     ECHOC               ;BR BACK
1177  005364  110120                ECHOB:  MOVB    R1,(0)+             ;SAVE CHAR
1178  005366  005037  001032               CLR     DSAVE               ;CLEAR FLAG
1179  005372  000137  005234               JMP     ECHOC               ;BR BACK
1180
1181
1182  005376  000200                CHRCNT: 200
```

```
                                        ;UPDATE OCTAL READOUT
                                
005400  042703  176000          KBCHR:  BIC     #176000,R3
005404  004737  005444                  JSR     PC,10$                  ;LOAD BITS
005410  110442                          MOVB    R4,-(R2)                ;SAVE BITS
005412  004737  005436                  JSR     PC,11$                  ;MOVE BITS
005416  110442                          MOVB    R4,-(R2)                ;SAVE BITS
005420  004737  005436                  JSR     PC,11$                  ;MOVE BITS
005424  110442                          MOVB    R4,-(R2)                ;SAVE BITS
005426  004737  005436                  JSR     PC,11$
005432  110442                          MOVB    R4,-(R2)
005434  000207                          RTS     PC
005436  006003                  11$:    ROR     R3
005440  006003                          ROR     R3
005442  006003                          ROR     R3
005444  010304                  10$:    MOV     R3,R4                   ;LOAD R4
005446  042704  177770                  BIC     #177770,R4              ;MASK BITS
005452  062704  000060                  ADD     #60,R4                  ;MAKE A NUMBER
005456  000207                          RTS     PC
                                
005460  012537  005620          MESG:   MOV     (5)+,COUNT
005464  012537  005622                  MOV     (5)+,FILE
005470  013777  005622  173356          MOV     FILE,@DPC               ;START DISPLAY
005476  005077  173306          MESGA:  CLR     @PSW
005502  000001                          WAIT
005504  005737  002114                  TST     KRBD
005510  001025                          BNE     MESGAB
005512  005337  005620          MESGAA: DEC     COUNT
005516  001405                          BEQ     MESGB
005520  012777  000001  173326          MOV     #1,@DPC                 ;SINGLE STEP THE DISPLAY
005526  000137  005476                  JMP     MESGA
005532  000240                  MESGB:  NOP
005534  005737  002114                  TST     KRBD
005540  001010                          BNE     MESGBA
005542  005037  005624                  CLR     SWITCH
005546  032777  000100  172416          BIT     #BIT6,@SWR
005554  001402                          BEQ     MESGBA
005556  005137  005624                  COM     SWITCH
005562  000205                  MESGBA: RTS     5
005564  005737  005624          MESGAB: TST     SWITCH
005570  001350                          BNE     MESGAA
005572  005737  001050                  TST     CHANGE
005576  001745                          BEQ     MESGAA
005600  005037  001050                  CLR     CHANGE
005604  005037  005624                  CLR     SWITCH
005610  005037  001042                  CLR     HOLD
005614  000137  001162                  JMP     SCOPEC
005620  000000          COUNT:  0
005622  000000          FILE:   0
005624  000000          SWITCH: 0
```

```
1233
1234  005626  114000                  FRMEO:  POINT
1235  005630  000000                          0
1236  005632  001500                          MAXY-277
1237  005634  170052                          STATSA!ITALO!SYNOFF!GREEN
1238  005636  103124                          CHAR!INT4!LPOFF!BLKOFF!LINEO
1239  005640     017     017                  .BYTE   17,17
1240  005642  052107  032055  020060         .ASCIZ  /GT-40 OR GT-44 WITH VR17 VISUAL TEST  (MD-11-DDGTG-B)/
1241  005650  051117  043440  026524
1242  005656  032064  053440  052111
1243  005664  020110  051126  033461
1244  005672  053040  051511  040525
1245  005700  020114  042524  052123
1246  005706  020040  046474  026504
1247  005714  030461  042055  043504
1248  005722  043524  041055  000076
1249  005730     015     012     012         .BYTE   15,12,12
1250  005733     040  020040  044504         .ASCII  /   DIRECTORY/
1251  005740  042522  052103  051117
1252  005746     131
1253  005747     015     012     012         .BYTE   15,12,12
1254  005752  030060  036440  040440         .ASCII  /00 = A = DIRECTORY/
1255  005760  036440  042040  051111
1256  005766  041505  047524  054522
1257  005774     015     012                 .BYTE   15,12
1258  005776  030460  036440  041040         .ASCII  /01 = B = DOT REPEATIBILITY/
1259  006004  036440  042040  052117
1260  006012  051040  050105  040505
1261  006020  044524  044502  044514
1262  006026  054524
1263  006030     015     012                 .BYTE   15,12
1264  006032  031060  036440  041440         .ASCII  /02 = C = PINCUSHION AND VECTOR CURVATURE (X OR Y OFFSET ADJ.)/
1265  006040  036440  050040  047111
1266  006046  052503  044123  047511
1267  006054  020116  047101  020104
1268  006062  042526  052103  051117
1269  006070  041440  051125  040526
1270  006076  052524  042522  036040
1271  006104  020130  051117  054440
1272  006112  047440  043106  042523
1273  006120  020124  042101  027112
1274  006126     076
1275  006127     015     012                 .BYTE   15,12
1276  006131     060  020063  020075         .ASCII  /03 = D = OCTAGONS OR SQUARES/
1277  006136  020104  020075  041517
1278  006144  040524  047507  051516
1279  006152  047440  020122  050523
1280  006160  040525  042522     123
1281  006165     015     012                 .BYTE   15,12
1282  006167     060  020064  020075         .ASCII  /04 = E = CHARACTER SET (CHAR. ADJ.)/
1283  006174  020105  020075  044103
1284  006202  051101  041501  042524
1285  006210  020122  042523  020124
1286  006216  041474  040510  027122
1287  006224  040440  045104  037056
1288  006232     015     012                 .BYTE   15,12
```

```
1289  006234  032460  036440  043040          .ASCII  /05 = F = DASH LINES AND BLINK/
1290  006242  036440  042040  051501
1291  006250  020110  044514  042516
1292  006256  020123  047101  020104
1293  006264  046102  047111     113
1294  006271     015     012
1295  006273     060  020066  020075          .BYTE   15,12
1296  006300  020107  020075  047510          .ASCII  /06 = G = HORIZONTAL VECTOR ANGLE (ADJ. X VECTOR LENGTH)/
1297  006306  044522  047532  052116
1298  006314  046101  053040  041505
1299  006322  047524  020122  047101
1300  006330  046107  020105  040474
1301  006336  045104  020056  020130
1302  006344  042526  052103  051117
1303  006352  046040  047105  052107
1304  006360  037110
1305  006362     015     012          .BYTE   15,12
1306  006364  033460  036440  044040          .ASCII  /07 = H = VERTICAL VECTOR ANGLE (ADJ. Y VECTOR LENGTH)/
1307  006372  036440  053040  051105
1308  006400  044524  040503  020114
1309  006406  042526  052103  051117
1310  006414  040440  043516  042514
1311  006422  036040  042101  027112
1312  006430  054440  053040  041505
1313  006436  047524  020122  042514
1314  006444  043516  044124     076
1315  006451     015     012          .BYTE   15,12
1316  006453     061  020060  020075          .ASCII  /10 = I = HORIZONTAL PHOSPHOR TEST/
1317  006460  020111  020075  047510
1318  006466  044522  047532  052116
1319  006474  046101  050040  047510
1320  006502  050123  047510  020122
1321  006510  042524  052123
1322  006514     015     012          .BYTE   15,12
1323  006516  030461  036440  045040          .ASCII  /11 = J = VERTICAL PHOSPHOR TEST/
1324  006524  036440  053040  051105
1325  006532  044524  040503  020114
1326  006540  044120  051517  044120
1327  006546  051117  052040  051505
1328  006554     124
1329  006555     015     012          .BYTE   15,12
1330  006557     061  020062  020075          .ASCII  /12 = K = INTENSITY LEVEL AND LIGHT-PEN TEST/
1331  006564  020113  020075  047111
1332  006572  042524  051516  052111
1333  006600  020131  042514  042526
1334  006606  020114  047101  020104
1335  006614  044514  044107  026524
1336  006622  042520  020116  042524
1337  006630  052123
1338  006632     015     012          .BYTE   15,12
1339  006634  031461  036440  046040          .ASCII  /13 = L = EDGE FLAG TEST/
1340  006642  036440  042440  043504
1341  006650  020105  046106  043501
1342  006656  052040  051505     124
1343  006663     015     012          .BYTE   15,12
1344  006665     061  020064  020075          .ASCII  /14 = M = SHORT VECTORS AND RELATIVE POINT/
```

```
1345  006672  020115  020075  044123
1346  006700  051117  020124  042526
1347  006706  052103  051117  020123
1348  006714  047101  020104  042522
1349  006722  040514  044524  042526
1350  006730  050040  044517  052116
1351  006736      015      012                    .BYTE   15,12
1352  006740  032461  036440  047040              .ASCII  /15 = N = GRAPHPLOT TEST/
1353  006746  036440  043440  040522
1354  006754  044120  046120  052117
1355  006762  052040  051505      124
1356  006767      015      012                    .BYTE   15,12
1357  006771      061  020066  020075              .ASCII  /16 = O = LIGHT PEN FOLLOW/
1358  006776  020117  020075  044514
1359  007004  044107  020124  042520
1360  007012  020116  047506  046114
1361  007020  053517
1362  007022      015      012                    .BYTE   15,12
1363  007024  033461  036440  050040              .ASCII  /17 = P = KEYBOARD ECHO TEST/
1364  007032  036440  045440  054505
1365  007040  047502  051101  020104
1366  007046  041505  047510  052040
1367  007054  051505      124
1368  007057      015      012      012           .BYTE   15,12,12
1369  007062  020040  052522  047502              .ASCII  /  RUBOUT TO REMAIN ON THE PATTERN/
1370  007070  052125  052040  020117
1371  007076  042522  040515  047111
1372  007104  047440  020116  044124
1373  007112  020105  040520  052124
1374  007120  051105      116
1375  007123      015      012                    .BYTE   15,12
1376  007125      040  041440  020122              .ASCIZ  /  CR TO SELECT SUB-PICTURE OR STOP MOTION /
1377  007132  047524  051440  046105
1378  007140  041505  020124  052523
1379  007146  026502  044520  052103
1380  007154  051125  020105  051117
1381  007162  051440  047524  020120
1382  007170  047515  044524  047117
1383  007176  000040
1384                                             .EVEN
1385  007200  173400                             DSTOP
1386  007202  160000                             DJMP
1387  007204  005626                             FRME0
1388
1389  007206                                FRME1:
1390  007206  170052                             STATSA!ITALO!SYNOFF!GREEN
1391  007210  116124                             POINT!INTO!LPOFF!BLKOFF!LINEO
1392  007212  041000                             INTX+1000
1393  007214  001000                             MAXY+1/2
1394  007216  040000                             INTX+0
1395  007220  000000                             0
1396  007222  041000                             INTX+1000
1397  007224  001000                             MAXY+1/2
1398  007226  041777                             INTX+1777
1399  007230  000000                             0
1400  007232  041000                             INTX+1000
```

```
1401  007234  001000                  MAXY+1/2
1402  007236  041777                  INTX+1777
1403  007240  001777                  MAXY
1404  007242  041000                  INTX+1000
1405  007244  001000                  MAXY+1/2
1406  007246  040000                  INTX
1407  007250  001777                  MAXY
1408  007252  164000                  DNOP
1409  007254  164000                  DNOP
1410  007256  164000                  DNOP
1411  007260  164000                  DNOP
1412  007262  164000                  DNOP
1413  007264  164000                  DNOP
1414  007266  164000                  DNOP
1415  007270  173400                  DSTOP
1416  007272  160000                  DJMP
1417  007274  007206                  FRME1
1418
1419                          ;FILE 2 <ANALOG TUNE-UP TEST >
1420
1421  007276  116524          FRME2:  POINT!INT2!LPOFF!BLKOFF!LINE0
1422  007300  000000                  0
1423  007302  000000                  0
1424  007304  170052                  STATSA!ITALO!SYNOFF!GREEN
1425  007306  110000                  LONGV
1426  007310  041777                  INTX!MAXX                       ; +X, +Y
1427  007312  000000                  0
1428  007314  040000                  INTX                            ; +X, +Y
1429  007316  001777                  MAXY
1430  007320  061777                  INTX!MINUSX!MAXX                ; -X, +Y
1431  007322  000000                  0
1432  007324  040000                  INTX                            ; +X, -Y
1433  007326  021777                  MINUSY!MAXY
1434  007330  041777                  INTX!MAXX                       ; +X, -Y
1435  007332  020000                  MINUSY
1436  007334  060000                  INTX!MINUSX                     ; -X, +Y
1437  007336  001777                  MAXY
1438  007340  061777                  INTX!MINUSX!MAXX                ; -X, -Y
1439  007342  020000                  MINUSY
1440  007344  060000                  INTX!MINUSX                     ; -X, -Y
1441  007346  021777                  MINUSY!MAXY
1442  007350  041777                  INTX!MAXX
1443  007352  001777                  MAXY
1444  007354  061777                  INTX!MINUSX!MAXX
1445  007356  021777                  MINUSX!MAXY
1446  007360  001777                  MAXX
1447  007362  000000                  0
1448  007364  061777                  INTX!MINUSX!MAXX
1449  007366  001777                  MAXY
1450  007370  041777                  INTX!MAXX
1451  007372  021777                  MINUSX!MAXY
1452  007374  173400                  DSTOP
1453  007376  160000                  DJMP
1454  007400  007276                  FRME2
1455
1456                          ;OCTAGONS
```

```
1457
1458   007402   117124          FRME3:  POINT!INT4!LPOFF!BLKOFF!LINEO
1459   007404   000774                  774
1460   007406   000564                  564
1461   007410   170052                  STATSA!ITALO!SYNOFF!GREEN
1462   007412   110000                  LONGV                          ;OCTOGON BY LENGTH OF 7
1463   007414   040007                  INTX+7
1464   007416   000000                  0
1465   007420   040007                  INTX+7
1466   007422   000007                  7
1467   007424   040000                  INTX
1468   007426   000007                  7
1469   007430   060007                  INTX!MINUSX+7
1470   007432   000007                  7
1471   007434   060007                  INTX!MINUSX+7
1472   007436   000000                  0
1473   007440   060007                  INTX!MINUSX+7
1474   007442   020007                  MINUSX+7
1475   007444   040000                  INTX
1476   007446   020007                  MINUSX+7
1477   007450   040007                  INTX+7
1478   007452   020007                  MINUSX+7
1479   007454   114000                  POINT
1480   007456   000770                  770
1481   007460   000550                  550
1482   007462   110000                  LONGV                          ;OCTOGON BY LENGTH OF 17
1483   007464   040017                  INTX+17
1484   007466   000000                  0
1485   007470   040017                  INTX+17
1486   007472   000017                  17
1487   007474   040000                  INTX
1488   007476   000017                  17
1489   007500   060017                  INTX!MINUSX+17
1490   007502   000017                  17
1491   007504   060017                  INTX!MINUSX+17
1492   007506   000000                  0
1493   007510   060017                  INTX!MINUSX+17
1494   007512   020017                  MINUSX+17
1495   007514   040000                  INTX
1496   007516   020017                  MINUSX+17
1497   007520   040017                  INTX+17
1498   007522   020017                  MINUSX+17
1499   007524   114000                  POINT
1500   007526   000760                  760
1501   007530   000520                  520
1502   007532   110000                  LONGV                          ;OCTOGON BY LENGTH OF 37
1503   007534   040037                  INTX+37
1504   007536   000000                  0
1505   007540   040037                  INTX+37
1506   007542   000037                  37
1507   007544   040000                  INTX
1508   007546   000037                  37
1509   007550   060037                  INTX!MINUSX+37
1510   007552   000037                  37
1511   007554   060037                  INTX!MINUSX+37
1512   007556   000000                  0
```

```
1513  007560  060037          INTX!MINUSX+37
1514  007562  020037          MINUSX+37
1515  007564  040000          INTX
1516  007566  020037          MINUSX+37
1517  007570  040037          INTX+37
1518  007572  020037          MINUSX+37
1519  007574  114000          POINT
1520  007576  000740          740
1521  007600  000440          440
1522  007602  110000          LONGV                   ;OCTOGON BY LENGTH OF 77
1523  007604  040077          INTX+77
1524  007606  000000          0
1525  007610  040077          INTX+77
1526  007612  000077          77
1527  007614  040000          INTX
1528  007616  000077          77
1529  007620  060077          INTX!MINUSX+77
1530  007622  000077          77
1531  007624  060077          INTX!MINUSX+77
1532  007626  000000          0
1533  007630  060077          INTX!MINUSX+77
1534  007632  020077          MINUSX+77
1535  007634  040000          INTX
1536  007636  020077          MINUSX+77
1537  007640  040077          INTX+77
1538  007642  020077          MINUSX+77
1539  007644  114000          POINT
1540  007646  000700          700
1541  007650  000300          300
1542  007652  110000          LONGV                   ;OCTOGON BY LENGTH OF 177
1543  007654  040177          INTX+177
1544  007656  000000          0
1545  007660  040177          INTX+177
1546  007662  000177          177
1547  007664  040000          INTX
1548  007666  000177          177
1549  007670  060177          INTX!MINUSX+177
1550  007672  000177          177
1551  007674  060177          INTX!MINUSX+177
1552  007676  000000          0
1553  007700  060177          INTX!MINUSX+177
1554  007702  020177          MINUSX+177
1555  007704  040000          INTX
1556  007706  020177          MINUSX+177
1557  007710  040177          INTX+177
1558  007712  020177          MINUSX+177
1559  007714  114000          POINT
1560  007716  000600          600
1561  007720  000000          0
1562  007722  110000          LONGV                   ;OCTOGON BY LENGTH OF 377
1563  007724  040377          INTX+377
1564  007726  000000          0
1565  007730  040377          INTX+377
1566  007732  000377          377
1567  007734  040000          INTX
1568  007736  000377          377
```

```
1569   007740  060377                          INTX!MINUSX+377
1570   007742  000377                          377
1571   007744  060377                          INTX!MINUSX+377
1572   007746  000000                          0
1573   007750  060377                          INTX!MINUSX+377
1574   007752  020377                          MINUSX+377
1575   007754  040000                          INTX
1576   007756  020377                          MINUSX+377
1577   007760  040377                          INTX+377
1578   007762  020377                          MINUSX+377
1579   007764  173400                          DSTOP
1580   007766  160000                          DJMP
1581   007770  007402                          FRME3
1582                                  ;SQUARES   7,17,37,77,177,377,777 WIDE
1583
1584   007772  117124                  FRME3A: POINT!INT4!LPOFF!BLKOFF!LINE0          ; BY 7
1585   007774  001000                          1000
1586   007776  000600                          600
1587   010000  170052                          STATSA!ITALO!SYNOFF!GREEN
1588           000007                          Q=7
1589           000004                          R=4
1590   010002  110000                          LONGV                                  ;BY 7 AND 4
1591   010004  040007                          INTX+7
1592   010006  000000                          0
1593   010010  040000                          INTX
1594   010012  000007                          7
1595   010014  060007                          INTX!MINUSX+7
1596   010016  000000                          0
1597   010020  040000                          INTX
1598   010022  020007                          MINUSX+7
1599   010024  020004                          MINUSX+4
1600   010026  020004                          MINUSX+4
1601                                           .LIST
1602   010030  110000                          LONGV                                  ;BY 17 AND 7
1603   010032  040017                          INTX+17
1604   010034  000000                          0
1605   010036  040000                          INTX
1606   010040  000017                          17
1607   010042  060017                          INTX!MINUSX+17
1608   010044  000000                          0
1609   010046  040000                          INTX
1610   010050  020017                          MINUSX+17
1611   010052  020007                          MINUSX+7
1612   010054  020007                          MINUSX+7
1613                                           .LIST
1614   010056  110000                          LONGV                                  ;BY 37 AND 17
1615   010060  040037                          INTX+37
1616   010062  000000                          0
1617   010064  040000                          INTX
1618   010066  000037                          37
1619   010070  060037                          INTX!MINUSX+37
1620   010072  000000                          0
1621   010074  040000                          INTX
1622   010076  020037                          MINUSX+37
1623   010100  020017                          MINUSX+17
1624   010102  020017                          MINUSX+17
```

```
1625                                    .LIST
1626  010104  110000                    LONGV                           ;BY 77 AND 37
1627  010106  040077                    INTX+77
1628  010110  000000                    0
1629  010112  040000                    INTX
1630  010114  000077                    77
1631  010116  060077                    INTX!MINUSX+77
1632  010120  000000                    0
1633  010122  040000                    INTX
1634  010124  020077                    MINUSX+77
1635  010126  020037                    MINUSX+37
1636  010130  020037                    MINUSX+37
1637                                    .LIST
1638  010132  110000                    LONGV                           ;BY 177 AND 77
1639  010134  040177                    INTX+177
1640  010136  000000                    0
1641  010140  040000                    INTX
1642  010142  000177                    177
1643  010144  060177                    INTX!MINUSX+177
1644  010146  000000                    0
1645  010150  040000                    INTX
1646  010152  020177                    MINUSX+177
1647  010154  020077                    MINUSX+77
1648  010156  020077                    MINUSX+77
1649                                    .LIST
1650  010160  110000                    LONGV                           ;BY 377 AND 177
1651  010162  040377                    INTX+377
1652  010164  000000                    0
1653  010166  040000                    INTX
1654  010170  000377                    377
1655  010172  060377                    INTX!MINUSX+377
1656  010174  000000                    0
1657  010176  040000                    INTX
1658  010200  020377                    MINUSX+377
1659  010202  020177                    MINUSX+177
1660  010204  020177                    MINUSX+177
1661                                    .LIST
1662  010206  110000                    LONGV                           ;BY 777 AND 377
1663  010210  040777                    INTX+777
1664  010212  000000                    0
1665  010214  040000                    INTX
1666  010216  000777                    777
1667  010220  060777                    INTX!MINUSX+777
1668  010222  000000                    0
1669  010224  040000                    INTX
1670  010226  020777                    MINUSX+777
1671  010230  020377                    MINUSX+377
1672  010232  020377                    MINUSX+377
1673                                    .LIST
1674  010234  173400                    DSTOP
1675  010236  160000                    DJMP
1676  010240  007772                    FRME3A
1677
1678                          ;DASH LINE TEST
1679
1680  010242  117000          FRME5:    POINT!INT4
```

```
1681  010244  000000                          0
1682  010246  001000                          1000
1683  010250  174400                          STATSB!SIZED0
1684  010252  170052                          STATSA!ITALD!SYNOFF!GREEN
1685  010254  100004                          CHAR!LINED
1686  010256     017     017                  .BYTE   17,17
1687  010260  047523  044514  020104          .ASCII /SOLID     /
1688  010266  020040  020040
1689  010272  110004                          LONGV!LINED
1690  010274  040400                          40400
1691  010276  000000                          0
1692  010300  000400                          400
1693  010302  000000                          0
1694  010304  110030                          LONGV!BLKON
1695  010306  040400                          40400
1696  010310  000000                          0
1697  010312  100020                          CHAR!BLKOFF
1698  010314     015     012     012          .BYTE   15,12,12,12,12,12
1699  010317     012     012     012
1700  010322  040504  044123  044440          .ASCII /DASH I    /
1701  010330  020040  020040
1702  010334  110005                          LONGV!LINE1
1703  010336  040400                          40400
1704  010340  000000                          0
1705  010342  000400                          400
1706  010344  000000                          0
1707  010346  110030                          LONGV!BLKON
1708  010350  040400                          40400
1709  010352  000000                          0
1710  010354  100020                          CHAR!BLKOFF
1711  010356     015     012     012          .BYTE   15,12,12,12,12,12
1712  010361     012     012     012
1713  010364  040504  044123  044440          .ASCII /DASH II   /
1714  010372  020111  020040
1715  010376  110006                          LONGV!LINE2
1716  010400  040400                          40400
1717  010402  000000                          0
1718  010404  000400                          400
1719  010406  000000                          0
1720  010410  110030                          LONGV!BLKON
1721  010412  040400                          40400
1722  010414  000000                          0
1723  010416  100020                          CHAR!BLKOFF
1724  010420     015     012     012          .BYTE   15,12,12,12,12,12
1725  010423     012     012     012
1726  010426  040504  044123  044440          .ASCII /DASH III  /
1727  010434  044511  020040
1728  010440  110007                          LONGV!LINE3
1729  010442  040400                          40400
1730  010444  000000                          0
1731  010446  000400                          400
1732  010450  000000                          0
1733  010452  110030                          LONGV!BLKON
1734  010454  040400                          40400
1735  010456  000000                          0
1736  010460  110024                          LONGV!BLKOFF!LINED
```

```
1737  010462  000000                    0
1738  010464  000000                    0
1739  010466  173400                    DSTOP
1740  010470  160000                    DJMP
1741  010472  010242                    FRME5
1742
1743                              ;VECTOR LENGTH TEST (FILE 6 AND 7)
1744
1745  010474  114000              FRME6:  POINT
1746  010476  001777                     MAXX
1747  010500  000000                     0
1748  010502  170052                     STATSA!ITALO!SYNOFF!GREEN
1749  010504  113724                     LONGV!INT7!LPOFF!BLKOFF!LINE0
1750  010506  040000                     INTX
1751  010510  001777                     MAXY
1752  010512  114000                     POINT
1753  010514  000000                     0
1754  010516  001777                     MAXY
1755  010520  110000                     LONGV
1756  010522  041777                     INTX!MAXX
1757  010524  000000                     0
1758  010526  173400                     DSTOP
1759  010530  114000              FRME6A: POINT
1760  010532  000000                     0
1761  010534  000000                     0
1762  010536  110000                     LONGV
1763  010540  000000              DELTX6: 0
1764  010542  000000              DELTY6: 0
1765  010544  173400                     DSTOP
1766  010546  160000                     DJMP
1767  010550  010530                     FRME6A
1768
1769
1770                              ;PHOSPHOR TEST
1771
1772  010552  114000              FRME10: POINT
1773  010554  000000              DELTX7: 0
1774  010556  000000                     0
1775  010560  170052                     STATSA!ITALO!SYNOFF!GREEN
1776  010562  113724              DFI10A: LONGV!INT7!LPOFF!BLKOFF!LINE0
1777  010564  040000                     INTX
1778  010566  001777                     MAXY
1779  010570  000002                     2
1780  010572  000000                     0
1781  010574  040000                     INTX
1782  010576  021777                     MINUSY!MAXY
1783  010600  000002                     2
1784  010602  000000                     0
1785  010604  173400                     DSTOP
1786  010606  160000                     DJMP
1787  010610  010562                     DFI10A
1788
1789                              ;PHOSPHOR TEST
1790
1791  010612  114000              FRME11: POINT
1792  010614  000000                     0
```

```
1793  010616  000000                    DELTY7: 0
1794  010620  170052                            STATSA!ITALO!SYNOFF!GREEN
1795  010622  113724                    DFI11C: LONGV!INT7!LPOFF!BLKOFF!LINE0
1796  010624  041777                            INTX!MAXX
1797  010626  000000                            0
1798  010630  000000                            0
1799  010632  000002                            2
1800  010634  061777                            INTX!MINUSX!MAXX
1801  010636  000000                            0
1802  010640  000000                            0
1803  010642  000002                            2
1804  010644  173400                            DSTOP
1805  010646  160000                            DJMP
1806  010650  010622                            DFI11C
1807
1808  010652  117604                    FRM10:  POINT!INT7!LINE0
1809  010654  000000                            0
1810  010656  000000                            0
1811  010660  110000                            LONGV
1812  010662  041777                            INTX!MAXX
1813  010664  000000                            0
1814  010666  040000                            INTX
1815  010670  001777                            MAXY
1816  010672  061777                            INTX!MINUSX!MAXX
1817  010674  000000                            0
1818  010676  040000                            INTX
1819  010700  021777                            MINUSX!MAXY
1820  010702  173400                            DSTOP
1821  010704  160000                            DJMP
1822  010706  010652                            FRM10
1823
1824                                    ;INTENSITY TEST
1825
1826  010710  114164                    FRME12: POINT!LINE0!LPON!BLKOFF
1827  010712  000000                            0
1828  010714  001200                            1200
1829  010716  170252                    SYN12:  STATSA!LPLITE!SYNOFF!ITALO!GREEN
1830  010720  103600                            CHAR!INT7
1831  010722     017     017                    .BYTE   17,17
1832  010724  047111  042524  051516            .ASCII /INTENSITY 7   /
1833  010732  052111  020131  020067
1834  010740  020040
1835  010742  110000                            LONGV
1836  010744  041000                            41000
1837  010746  000000                            0
1838  010750  130000                            RELATV
1839  010752  057600                            57600
1840  010754  103400                            CHAR!INT6
1841  010756     015     012     012            .BYTE 15,12,12,12
1842  010761     012
1843  010762  047111  042524  051516            .ASCII /INTENSITY 6   /
1844  010770  052111  020131  020066
1845  010776  020040
1846  011000  110000                            LONGV
1847  011002  041000                            41000
1848  011004  000000                            0
```

```
1848   011006  130000                          RELATV
1850   011010  057600                          57600
1851   011012  103200                          CHAR!INT5
1852   011014     015      012      012        .BYTE 15,12,12,12
1853   011017     012
1854   011020  047111  042524  051516          .ASCII /INTENSITY 5   /
1855   011026  052111  020131  020065
1856   011034  020040
1857   011036  110000                          LONGV
1858   011040  041000                          41000
1859   011042  000000                          0
1860   011044  130000                          RELATV
1861   011046  057600                          57600
1862   011050  103000                          CHAR!INT4
1863   011052     015      012      012        .BYTE 15,12,12,12
1864   011055     012
1865   011056  047111  042524  051516          .ASCII /INTENSITY 4   /
1866   011064  052111  020131  020064
1867   011072  020040
1868   011074  110000                          LONGV
1869   011076  041000                          41000
1870   011100  000000                          0
1871   011102  130000                          RELATV
1872   011104  057600                          57600
1873   011106  102600                          CHAR!INT3
1874   011110     015      012      012        .BYTE 15,12,12,12
1875   011113     012
1876   011114  047111  042524  051516          .ASCII /INTENSITY 3   /
1877   011122  052111  020131  020063
1878   011130  020040
1879   011132  110000                          LONGV
1880   011134  041000                          41000
1881   011136  000000                          0
1882   011140  130000                          RELATV
1883   011142  057600                          57600
1884   011144  102400                          CHAR!INT2
1885   011146     015      012      012        .BYTE 15,12,12,12
1886   011151     012
1887   011152  047111  042524  051516          .ASCII /INTENSITY 2   /
1888   011160  052111  020131  020062
1889   011166  020040
1890   011170  110000                          LONGV
1891   011172  041000                          41000
1892   011174  000000                          0
1893   011176  130000                          RELATV
1894   011200  057600                          57600
1895   011202  102200                          CHAR!INT1
1896   011204     015      012      012        .BYTE 15,12,12,12
1897   011207     012
1898   011210  047111  042524  051516          .ASCII /INTENSITY 1   /
1899   011216  052111  020131  020061
1900   011224  020040
1901   011226  110000                          LONGV
1902   011230  041000                          41000
1903   011232  000000                          0
1904   011234  130000                          RELATV
```

```
 1905  011236  057600                          57600
 1906  011240  102000                          CHAR!INTO
 1907  011242     015     012     012          .BYTE 15,12,12,12
 1908  011245     012
 1909  011246  047111  042524  051516          .ASCII /INTENSITY 0   /
 1910  011254  052111  020131  020060
 1911  011262  020040
 1912  011264  110000                          LONGV
 1913  011266  041000                          41000
 1914  011270  000000                          0
 1915  011272  130000                          RELATV
 1916  011274  057600                          57600
 1917  011276  164000                          DNOP
 1918  011300  164000                          DNOP
 1919  011302  164000                          DNOP
 1920  011304  164000                          DNOP
 1921  011306  164000                          DNOP
 1922  011310  164000                          DNOP
 1923  011312  164000                          DNOP
 1924  011314  164000                          DNOP
 1925  011316  173400                RAYLPA:   DSTOP
 1926  011320  164000                          DNOP
 1927  011322  164000                          DNOP
 1928
 1929  011324  117100                DFI12A:   POINT!INT4!LPOFF
 1930  011326  001500                          1500
 1931  011330  001200                LPPNT:    1200
 1932  011332  100000                          CHAR
 1933  011334  044514  044107  020124          .ASCIZ  /LIGHT PEN HIT/
 1934  011342  042520  020116  044510
 1935  011350  000124
 1936                                          .EVEN
 1937  011352  173400                          DSTOP
 1938  011354  160000                          DJMP
 1939  011356  010710                          FRME12
 1940
 1941                                :EDGE FILE
 1942
 1943  011360  117124                FRME13:   POINT!INT4!LPOFF!BLKOFF!LINEO
 1944  011362  000000                          0
 1945  011364  000000                          0
 1946  011366  170052                          STATSA!ITALO!SYNOFF!GREEN
 1947  011370  100000                          CHAR
 1948  011372     017     017                  .BYTE   17,17
 1949  011374  110000                          LONGV
 1950  011376  041777                          INTX!MAXX
 1951  011400  000000                          0
 1952  011402  040000                          INTX
 1953  011404  001777                          MAXY
 1954  011406  061777                          INTX!MINUSX!MAXX
 1955  011410  000000                          0
 1956  011412  040000                          INTX
 1957  011414  021777                          MINUSY!MAXY
 1958  011416  114000                          POINT
 1959  011420  000100                          100
 1960  011422  000300                          300                          ;LEFT SIDE
```

```
 1961  011424  110000                    LONGV
 1962  011426  040000                    INTX
 1963  011430  000400                    400
 1964  011432  060200                    INTX!MINUSX+200
 1965  011434  000000                    0
 1966  011436  040000                    INTX
 1967  011440  020400                    MINUSY+400
 1968  011442  040200                    INTX+200
 1969  011444  000000                    0
 1970  011446  114000                    POINT
 1971  011450  000200                    200                         ;TOP SIDE
 1972  011452  001700                    MAXY+1-100
 1973  011454  110000                    LONGV
 1974  011456  040400                    INTX+400
 1975  011460  000000                    0
 1976  011462  040000                    INTX
 1977  011464  000200                    200
 1978  011466  060400                    INTX!MINUSX+400
 1979  011470  000000                    0
 1980  011472  040000                    INTX
 1981  011474  020200                    MINUSY+200
 1982  011476  114000                    POINT                       ;RIGHT SIDE
 1983  011500  001700                    1700
 1984  011502  001500                    MAXY+1-300
 1985  011504  110000                    LONGV
 1986  011506  040000                    INTX
 1987  011510  020400                    MINUSY+400
 1988  011512  040200                    INTX+200
 1989  011514  000000                    0
 1990  011516  040000                    INTX
 1991  011520  000400                    400
 1992  011522  060200                    INTX!MINUSX+200
 1993  011524  000000                    0
 1994  011526  114000                    POINT
 1995  011530  001600                    1600                        ;BOTTOM SIDE
 1996  011532  000100                    100
 1997  011534  110000                    LONGV
 1998  011536  060400                    INTX!MINUSX+400
 1999  011540  000000                    0
 2000  011542  040000                    INTX
 2001  011544  020200                    MINUSY+200
 2002  011546  040400                    INTX+400
 2003  011550  000000                    0
 2004  011552  040000                    INTX
 2005  011554  000200                    200
 2006  011556  114000                    POINT
 2007  011560  001777                    MAXX
 2008  011562  000400                    400
 2009  011564  110000                    LONGV
 2010  011566  000020                    20
 2011  011570  000000                    0
 2012  011572  100000                    CHAR
 2013  011574     015        101         .BYTE   15,101          ;"CR" AND AN "A"
 2014  011576  114000                    POINT
 2015  011600  000000                    0
 2016  011602  000500                    500
```

```
2017  011604  110000                          LONGV
2018  011606  020012                          MINUSX+12
2019  011610  000000                          0
2020  011612  100000                          CHAR
2021  011614     040      102                 .BYTE   40,102          ;"SPACE" AND AN "B"
2022  011616  164000                          DNOP
2023  011620  164000                          DNOP
2024  011622  173400                          DSTOP
2025  011624  164000                          DNOP
2026  011626  164000                          DNOP
2027  011630  160000                          DJMP
2028  011632  011360                          FRME13
2029
```

```
2030
2031
2032  011634  170052          FRME14: STATSA!ITALO!SYNOFF!GREEN
2033  011636  117124                  POINT!INT4!BLKOFF!LPOFF!LINEO
2034  011640  000000          FRM14A: 0
2035  011642  000000          FRM14B: 0
2036  011644  104000                  SHORTV
2037  011646  056200                  INTX+16200
2038  011650  056271                  INTX+16200+71
2039  011652  040071                  INTX+71
2040  011654  076271                  INTX!MINUSX+16200+71
2041  011656  076200                  INTX!MINUSX+16200
2042  011660  076371                  INTX!MINUSX+16200+MINSUY+71
2043  011662  040171                  INTX+MINSUY+71
2044  011664  056371                  INTX+16200+MINSUY+71
2045  011666  020504                  20504
2046  011670  164000                  DNOP
2047  011672  164000                  DNOP
2048  011674  130000                  RELATV
2049  011676  057000                  INTX+17000
2050  011700  057074                  INTX+17000+74
2051  011702  040074                  INTX+74
2052  011704  077074                  INTX!MINUSX+17000+74
2053  011706  077000                  INTX!MINUSX+17000
2054  011710  077174                  INTX!MINUSX+17000+MINSUY+74
2055  011712  040174                  INTX+MINSUY+74
2056  011714  057174                  INTX+17000+MINSUY+74
2057  011716  020504                  20504
2058  011720  164000                  DNOP
2059  011722  164000                  DNOP
2060  011724  104000                  SHORTV
2061  011726  057600                  INTX+17600
2062  011730  057677                  INTX+17600+77
2063  011732  040077                  INTX+77
2064  011734  077677                  INTX!MINUSX+17600+77
2065  011736  077600                  INTX!MINUSX+17600
2066  011740  077777                  INTX!MINUSX+17600+MINSUY+77
2067  011742  040177                  INTX+MINSUY+77
2068  011744  057777                  INTX+17600+MINSUY+77
2069  011746  020504                  20504
2070  011750  164000                  DNOP
2071  011752  164000                  DNOP
2072  011754  173400                  DSTOP
2073  011756  160000                  DJMP
2074  011760  011634                  FRME14
```

```
2075
2076  011762  117724                  FRME16: POINT!INT7!LPOFF!BLKOFF!LINED
2077  011764  000000                          0
2078  011766  001600                          MAXY-177
2079  011770  170052                          STATSA!ITALO!SYNOFF!GREEN
2080  011772  100000                          CHAR
2081  011774      017       017               .BYTE   17,17
2082  011776  044514  044107  020124          .ASCII  /LIGHT PEN FOLLOW TEST /
2083  012004  042520  020116  047506
2084  012012  046114  053517  052040
2085  012020  051505  020124
2086  012024      015       012       012     .BYTE   15,12,12
2087  012027      130   020075                .ASCII  /X= /
2088  012032  030061  030060          DLT14A: .ASCII  /1000/
2089  012036      015       012       012     .BYTE   15,12,12
2090  012041      131   020075                .ASCII  /Y= /
2091  012044  033060  030060          DLT14B: .ASCII  /0600/
2092  012050  114140                          POINT!LPON
2093  012052  001000                  RAY14A: 1000
2094  012054  000600                  RAY14B: 600
2095  012056  164000                          DNOP
2096  012060  164000                          DNOP
2097  012062  130000                          RELATV
2098  012064  074000                  TAB16A: INTX!MINUSX+14000
2099  012066  041000                          INTX+1000
2100  012070  041000                          INTX+1000
2101  012072  041000                          INTX+1000
2102  012074  041000                          INTX+1000
2103  012076  041000                          INTX+1000
2104  012100  041000                          INTX+1000
2105  012102  041000                          INTX+1000
2106  012104  041000                          INTX+1000
2107  012106  041000                          INTX+1000
2108  012110  041000                          INTX+1000
2109  012112  041000                          INTX+1000
2110  012114  041000                          INTX+1000
2111  012116  041000                          INTX+1000
2112  012120  041000                          INTX+1000
2113  012122  041000                          INTX+1000
2114  012124  041000                          INTX+1000
2115  012126  041000                          INTX+1000
2116  012130  041000                          INTX+1000
2117  012132  041000                          INTX+1000
2118  012134  041000                          INTX+1000
2119  012136  041000                          INTX+1000
2120  012140  041000                          INTX+1000
2121  012142  041000                          INTX+1000
2122  012144  041000                          INTX+1000
2123  012146  164000                          DNOP
2124  012150  164000                          DNOP
2125  012152  164000                          DNOP
2126  012154  164000                          DNOP
2127  012156  164000                          DNOP
2128  012160  164000                          DNOP
2129  012162  164000                          DNOP
2130  012164  164000                          DNOP
```

```
2131   012166   164000                    DNOP
2132   012170   164000                    DNOP
2133   012172   130000                    RELATV
2134   012174   034000                    MINUSX+14000
2135   012176   040160           TAB16B:  INTX!MINSUY+60
2136   012200   040004                    INTX+4
2137   012202   040004                    INTX+4
2138   012204   040004                    INTX+4
2139   012206   040004                    INTX+4
2140   012210   040004                    INTX+4
2141   012212   040004                    INTX+4
2142   012214   040004                    INTX+4
2143   012216   040004                    INTX+4
2144   012220   040004                    INTX+4
2145   012222   040004                    INTX+4
2146   012224   040004                    INTX+4
2147   012226   040004                    INTX+4
2148   012230   040004                    INTX+4
2149   012232   040004                    INTX+4
2150   012234   040004                    INTX+4
2151   012236   040004                    INTX+4
2152   012240   040004                    INTX+4
2153   012242   040004                    INTX+4
2154   012244   040004                    INTX+4
2155   012246   040004                    INTX+4
2156   012250   040004                    INTX+4
2157   012252   040004                    INTX+4
2158   012254   040004                    INTX+4
2159   012256   040004                    INTX+4
2160   012260   164000                    DNOP
2161   012262   164000                    DNOP
2162   012264   164000                    DNOP
2163   012266   164000                    DNOP
2164   012270   164000                    DNOP
2165   012272   164000                    DNOP
2166   012274   164000                    DNOP
2167   012276   164000                    DNOP
2168   012300   110000                    LONGV
2169   012302   000000                    0
2170   012304   000077                    77
2171   012306   040160           PNT16A:  INTX+160
2172   012310   020160                    MINUSX+160
2173   012312   060160           PNT16B:  INTX!MINUSX+160
2174   012314   020160                    MINUSX+160
2175   012316   060160           PNT16C:  INTX!MINUSX+160
2176   012320   000160                    160
2177   012322   040160           PNT16D:  INTX+160
2178   012324   000160                    160
2179   012326   000200                    .WORD   200
2180   012330   000200                    .WORD   200
2181   012332   164000                    DNOP
2182   012334   164000                    DNOP
2183   012336   164000                    DNOP
2184   012340   164000                    DNOP
2185   012342   173400                    DSTOP
2186   012344   160000                    DJMP
```

```
2187  012346  011762                          FRME16
2188
2189  012350  117724                  FRM16A: POINT!INT7!LPOFF!BLKOFF!LINE0
2190  012352  000000                          0
2191  012354  001600                          MAXY-177
2192  012356  170052                          STATSA!ITALO!SYNOFF!GREEN
2193  012360  100000                          CHAR
2194  012362     017      017                 .BYTE   17,17
2195  012364  044514  044107  020124          .ASCII  /LIGHT PEN FIELD OF VIEW /
2196  012372  042520  020116  044506
2197  012400  046105  020104  043117
2198  012406  053040  042511  020127
2199  012414     015      012      012        .BYTE   15,12,12
2200  012417     116  046525  042502          .ASCII  /NUMBER OF HITS = 0000/
2201  012424  020122  043117  044040
2202  012432  052111  020123  020075
2203  012440  030060  030060
2204  012444  173400                  FRM16B: DSTOP
2205  012446  160000                          DJMP
2206  012450  012350                          FRM16A
2207
2208  012452  114124                  FRME17: POINT!LPOFF!BLKOFF!LINE0                    ;MUST BE JUST BEFORE THE BUFFER
2209  012454  000000                          0
2210  012456  001600                          MAXY-177
2211  012460  170052                          STATSA!ITALO!SYNOFF!GREEN
2212  012462  103000                          CHAR!INT4
2213  012464     017      017                 .BYTE   17,17
2214  012466  042513  041131  040517          .ASCIZ  /KEYBOARD ECHO TEST/
2215  012474  042122  042440  044103
2216  012502  020117  042524  052123
2217  012510     000
2218  012511     015      012      012        .BYTE   15,12,12
2219  012514  044103  051101  047440          .ASCII  /CHAR OCT = /
2220  012522  052103  036440      040
2221  012527     000      000      000        .BYTE   0,0,0,0
2222  012532     000
2223  012533     015      012      012  KBOCT: .BYTE   15,12,12
2224
2225  012536  164000                  BUFFER: DNOP
2226
2227          000001                          .END
```

```
BIT6   = 000100   609#  1218
BLKOFF= 000020   609#   704   1238   1391   1421   1458   1584   1697   1710   1723   1736   1749   1776
                1795   1826   1943   2033   2076   2185   2208
BLKON  = 000030   609#   1694   1707   1720   1733
BUFFER  012536.   409    410    411    412    413    414    627    654    668    701    723    772*   775
                 777*   780    921    931    964    974    990    998   1026   1034   1053   1128*  1135
                1137   1149   2225#
CHANGE  001050   422#   589*   1224   1226*
CHAR   = 100000   609#   707   1238   1685   1697   1710   1723   1830   1840   1851   1862   1873   1884
                1895   1906   1932   1947   2012   2020   2080   2193   2212
CHRCNT  005376   1148*  1165*  1182#
CNTR    001046   421#   663*   674*   680*   686*   693*   801*   813*   828*   840*   934*   937*   1071*
                1076*
COUNT   005620   1203*  1210*  1230#
CRLF    002736   745    750#
DBUF    001016   409#
DBUF1   001020   410#
DBUF2   001022   411#
DBUF3   001024   412#
DBUF4   001026   413#   999*   1000   1002*
DBUF5   001030   414#   992*   995*
DDONE   001064   434#   524    528    563*
DDONE1  001066   435#   564*
DELTX6  010540   798*   830*   837*   1763#
DELTX7  010554   852*   862*   863    1773#
DELTY6  010542   803*   810*   826*   1764#
DELTY7  010616   869*   879*   880    1793#
DFI10A  010562  1776#  1787
DFI11C  010622  1795#  1806
DFI12A  011324  1929#
DFL15B  004310   994    996#   1001
DFL15C  004212   981#
DFL15D  004266   992#  1004
DISPTC  001210   466    468#
DJMP   = 160000   609#   653    722    930    989   1033   1386   1416   1453   1580   1675   1740   1766
                1786   1805   1821   1938   2027   2073   2186   2205
DLT14A  012032   538*   539*  1093   2088#
DLT14B  012044   540*   541*  1096   2091#
DNOP   = 164000   609#   902   1408   1409   1410   1411   1412   1413   1414   1917   1918   1919   1920
                1921   1922   1923   1924   1926   1927   2022   2023   2025   2026   2046   2047   2058
                2059   2070   2071   2095   2096   2123   2124   2125   2126   2127   2128   2129   2130
                2131   2132   2160   2161   2162   2163   2164   2165   2166   2167   2181   2182   2183
                2184   2225
DPC     001054   429#   518    522    906*  1101*  1205*  1212*
DSAVE   001032   415#   802*   811*   829*   838*   889*   898*   982*   984*   985    991*   1003*  1027*
                1056*  1140*  1171   1175*  1178*
DSAVE1  001034   416#   800*   803    818*   825*   830    845*   1025*  1059*
DSAVE2  001036   417#   799*   819*   827*   846*
DSAVE3  001040   418#
DSR     001056   430#   571
DSTOP  = 173400   609#   652    721    900    929    988   1032   1136   1385   1415   1452   1579   1674
                1739   1758   1765   1785   1804   1820   1925   1937   2024   2072   2185   2204
DSWR   = 177570   380#   395    550
D7A     003376   853#   861    864
D7C     003426   862#
D7D     003452   870#   878    881
```

```
D7F     003502          879#
ECHOA   005126         1136#   1138
ECHOB   005364         1172    1177#
ECHOC   005234         1150#   1155    1176    1179
ERRVEC= 000004          378#    548     549*    556*
FILE    005622         1204*   1205    1231#
FILE0   002116          468     542     612#    1015
FILE1   002130          469     619#
FILE10  003370          476     851#
FILE11  003444          477     868#
FILE12  003520          478     886#
FILE13  003662          479     913#
FILE14  003674          480     920#
FILE15  004154          481     967     973#
FILE16  004410          482    1022#   1061
FILE17  005120          483    1134#   1167
FILE2   002142          470     626#
FILE2A  002342          655     663#
FILE2B  002350          664#    675
FILE2C  002370          665     671#
FILE2D  002400          669     674#
FILE3   002406          471     679#
FILE3A  002416          681#    687     694
FILE3B  002444          682     690#
FILE4   002462          472     688     700#
FILE4A  003014          724     771#
FILE5   003072          473     784     790#
FILE6   003104          474     797#
FILE7   003236          475     824#
FILLA   002764          757#    760
FILLIT  002760          740     744     756#
FIL14A  004002          932     941#
FLE12A  003544          890#    901
FLE12B  003562          891     894#
FLE12C  003570          893     895#
FLE12D  003654          899     908#
FRME0   005626          615    1234#   1387
FRME1   007206          622    1389#   1417
FRME10  010552          855    1772#
FRME11  010612          872    1791#
FRME12  010710          897    1826#   1939
FRME13  011360          916    1943#   2028
FRME 4  011634          946     951     956     961     2032#   2074
FRME16  011762         1044    2076#   2187
FRME17  012452         1152    2208#
FRME2   007276          673    1421#   1454
FRME3   007402          685    1458#   1581
FRME3A  007772          692    1584#   1676
FRME5   010242          793    1680#   1741
FRME6   010474          806     833    1745#
FRME6A  010530          809     836    1759#   1767
FRM10   010652          858     875    1808#   1822
FRM14A  011640          942*    947*    952*    957*   2034#
FRM14B  011642          943*    948*    953*    958*   2035#
FRM16A  012350         1049    2189#   2206
FRM16B  012444         1036*   1037*   1089    2204#
```

```
GRAPHX= 120000          609#   980
GRAPHY= 124000          609#
GREEN = 000002          609#   703   978  1237  1390  1424  1461  1587  1684  1748  1775  1794  1829
                       1946  2032  2079  2192  2211
GSADD   001000          401#   510
GSBRL   001004          403#   888  1024
GSVCT   001002          402#   525
HERE    004376         1007  1015#
H.GPWR  001306          494   499#
H.ICNT  005116         1035* 1087* 1088  1131#
HOLD    001042          419#   453   531*  535*  591*  595*  597*  1228*
.CNT    001006          405#
.NCR  = 000100          609#   979  1002
INTX  = 040000          609#   630   638   642   650   798   825   935  1066  1128  1392  1394  1396
                       1398  1400  1402  1404  1406  1426  1428  1430  1432  1434  1436  1438  1440
                       1442  1444  1446  1450  1463  1465  1467  1469  1471  1473  1475  1477  1483
                       1485  1487  1489  1491  1493  1495  1497  1503  1505  1507  1509  1511  1513
                       1515  1517  1523  1525  1527  1529  1531  1533  1535  1537  1543  1545  1547
                       1549  1551  1553  1555  1557  1563  1565  1567  1569  1571  1573  1575  1577
                       1591  1593  1595  1597  1603  1605  1607  1609  1611  1615  1617  1619  1621
                       1623  1631  1633  1639  1641  1643  1645  1651  1653  1655  1657  1663  1665
                       1667  1669  1750  1756  1777  1781  1796  1800  1812  1814  1816  1818  1820
                       1952  1954  1956  1962  1964  1966  1968  1974  1976  1978  1980  1986  1988
                       1990  1992  1998  2000  2002  2004  2037  2038  2039  2040  2041  2042  2043
                       2044  2049  2050  2051  2052  2053  2054  2055  2056  2061  2062  2063  2064
                       2065  2066  2067  2068  2098  2099  2100  2101  2102  2103  2104  2105  2106
                       2107  2108  2109  2110  2111  2112  2113  2114  2115  2116  2117  2118  2119
                       2120  2121  2122  2135  2136  2137  2138  2139  2140  2141  2142  2143  2144
                       2145  2146  2147  2148  2149  2150  2151  2152  2153  2154  2155  2156  2157
                       2158  2159  2171  2173  2175  2177
INTO  = 002000          609#  1391  1906
INT1  = 002200          609#  1895
INT2  = 002400          609#  1421  1884
INT3  = 002600          609#  1873
INT4  = 003000          609#   657   704   925  1238  1458  1584  1680  1862  1929  1943  2033  2212
INT5  = 003200          609#  1851
INT6  = 003400          609#  1840
INT7  = 003600          609#   975  1028  1749  1776  1795  1808  1830  2076  2189
ITALO = 000040          609#   703   716   738   978  1237  1390  1424  1461  1587  1684  1748  1775
                       1794  1829  1946  2032  2079  2192  2211
ITAL1 = 000060          609#   719   742
KBCHR   005400         1090  1094  1097  1170  1185#
KBOCT   012533         1141* 1142* 1143* 1144* 1168  2223#
KRBD    002114          445   547*  559*  607#  1208  1215
KYT1    002062          585   597#
KYT2    002042          587   593#
KYT3    002072          582   601#
KYT4    002104          594   605#
KYT5    002004          585#  606
LADVT   003762          935#  938
LINE0 = 000004          609#   704   925  1028  1238  1391  1421  1458  1584  1685  1689  1736  1749
                       1776  1795  1808  1826  1943  2033  2076  2189  2208
LINE1 = 000005          609#  1702
LINE2 = 000006          609#  1715
LINE3 = 000007          609#  1728
LOADAC  004602         1064#  1072
```

```
LOADBF  002672          711     713     715     738#
LOADSP  002632          717     720     726#
LOADUP  004624         1031    1071#
LOADVT  003754          926     928     934#
LOGICA  004364         1010#
LOKRB   001052          423#   1139*   1153    1158*   1161*
LONGV = 110000          609#    660    1073    1425    1462    1482    1502    1522    1542    1562    1590    1602    1614
                       1626    1638    1650    1662    1689    1694    1702    1707    1715    1720    1728    1733    1736
                       1749    1755    1762    1776    1795    1811    1835    1846    1857    1868    1879    1890    1901
                       1912    1948    1961    1973    1985    1997    2009    2017    2168
LOOPA   003130          801#    817     820
LOOPA1  003136          802#    814
LOOPA2  003162          807#    812
LOOPA3  003206          813#
LOOPB   003262          828#    844     847
LOOPB1  003270          829#    841
LOOPB2  003314          834#    839
LOOPB3  003340          840#
LOWPWR  001250          386     487#    506
LOWSV   001300          493*    497#    499
LPDARK= 000300          609#
LPLITE= 000200          609#   1829
LPOFF = 000100          609#    704    1238    1391    1421    1458    1584    1749    1776    1795    1929    1943    2033
                       2076    2189    2208
LPON  = 000140          609#   1028    1826    2092
LPPNT   011330          903*    904*   1931#
LPVCT   001070          437#    565*    887*    908*   1023*
LPVCT1  001072          438#    565     566*    888*    908    1024*
MAXSX = 017600          609#
MAXSY = 000077          609#
MAXX  = 001777          609#    642     644     650     798    1426    1430    1434    1438    1442    1444    1446    1448
                       1450    1746    1756    1796    1800    1812    1816    1950    1954    2007
MAXY  = 001777          609#    631     633     639     641     706     772     802     826     880     924     953     959
                       1236    1393    1397    1401    1403    1405    1407    1429    1433    1437    1441    1443    1445
                       1449    1451    1751    1754    1778    1782    1815    1819    1953    1957    1972    1984    2078
                       2191    2210
MESG    005460          613     620     666     671     683     690     773     778     791     804     807     831     834
                        853     856     870     873     895     914     944     949     954     959     962     996    1042
                       1047    1051    1150    1203#
MESGA   005476          907    1103    1206#   1213
MESGAA  005512         1210#   1223    1225
MESGAB  005564         1209    1222#
MESGB   005532         1211    1214#
MESGBA  005562         1216    1219    1221#
MINSUY= 000100          609#   2042    2043    2044    2054    2055    2056    2066    2067    2068    2135
MINUSX= 020000          609#    633     636     644     649    1075    1430    1436    1438    1440    1444    1445    1448
                       1451    1469    1471    1473    1474    1476    1478    1489    1491    1493    1494    1496    1498
                       1509    1511    1513    1514    1516    1518    1529    1531    1533    1534    1536    1538    1549
                       1551    1553    1554    1556    1558    1569    1571    1573    1574    1576    1578    1595    1598
                       1599    1600    1607    1610    1611    1612    1619    1622    1623    1624    1631    1634    1635
                       1636    1643    1646    1647    1648    1655    1658    1659    1660    1667    1670    1671    1672
                       1800    1816    1819    1954    1964    1978    1992    1998    2018    2040    2041    2042    2052
                       2053    2054    2064    2065    2066    2098    2134    2172    2173    2174    2175
MINUSY= 020000          609#   1433    1435    1439    1441    1782    1957    1967    1981    1987    2001
PNT16A  012306         2171#
PNT16B  012312         2173#
```

```
PNT16C  012316  2175#
PNT16D  012322  2177#
POINT = 114000   609#   657    704    922    975   1026   1234   1391   1421   1458   1479   1499   1519
                1539   1559   1584   1680   1746   1752   1759   1772   1791   1808   1926   1929   1943
                1958   1970   1982   1994   2006   2014   2033   2076   2092   2189   2208
PSW     001010   406#   517*  1206*
Q       001777  1588#  1590   1601#  1602   1613#  1614   1625#  1626   1637#  1638   1649#  1650   1661#
                1662   1673#
R       000777  1589#  1590   1601#  1602   1613#  1614   1625#  1626   1637#  1638   1649#  1650   1661#
                1662   1673#
RAYLPA  011316   900*   902*  1925#
RAY14A  012052   536*  1099*  2093#
RAY14B  012054   537*  1098*  2094#
RED     000003   609#
RELATV= 130000   609#   927   1065   1838   1949   1860   1871   1882   1893   1904   1915   2048   2097
                2133
RETB    001746   560    579#
RETLP   003616   887    902#
RET117  005254  1145   1156#
RET14   004662  1023   1081#
RET20   005314  1163   1165#
RET21   005276  1154   1161#
SCOPE = 104000   377#   612    619    626    679    700    790    797    824    851    868    886    913
                 920    973   1022   1134
SCOPEA  001100   390    445#
SCOPEB  001156   452    459#
SCOPEC  001162   460#  1229
SCOPED  001170   454    462#   515
SCOPEE  001126   449    451#
SCOPEF  001136   446    453#
SETPNT  002320   628    640    657#
SETUP   001536   456    464    534    544#
SETUPA  001670   558    563#
SETUPB  001732   563    571#
SHORTV= 104000   609#   925   2036   2060
SIZE0 = 000400   609#   702   1683
SIZE1 = 000600   609#
SPACE   002776   718    741    763#
START   001356   398    516#
STATSA= 170000   609#   703    716    719    738    742    978   1237   1390   1424   1461   1587   1684
                1748   1775   1794   1829   1946   2032   2079   2192   2211
STATSB= 174000   609#   702    979   1000   1002   1683
STCHAR  002734   710*   712*   714*   739    743    748#
STKPTR= 000500   379#   462    507    516
STRA    001400   520#   523
STRB    001424   526#   529
STRC    001456   534#  1164
SWITCH  005624   447*   450*   530*   583*   590*   601*   664    681    816    843    860    877    890
                 993   1039   1085  1217*  1220*  1222   1227*  1232#
SWR     000172   395#   448    451    459    550*   551    555*   557   1218
SWREG   000170   394#   555
SYNOFF= 000010   609#   703    978   1237   1390   1424   1461   1587   1684   1748   1775   1794   1829
                1946   2032   2079   2192   2211
SYNON = 000014   609#
SYN12   010716   892*   894*  1829#
TAB16A  012064  2098#
```

```
TAB:6B  012176            2135#
TIMEVT  001074             440#   567*
TKB     001014             408#   579    1156
TKS     001012             407#   546*    562*   1147*
TMEVT1  001076             441#   567     568*
TSAVE   001044             420#   533*    579*    580*   581    584*   586    588    593    605*
XPOS    001060             431#  1083
YPOS    001062             432#   903    1081
.     = 012540             383#   385#    389#   393#   397#   400#   572
```

```
CLEARA   610#  1237  1389  1424  1461  1587  1748  1775  1794  1946  2079  2192  2211
COMMEN     1#
DSTEP    426#   906  1100  1212
ENDCOM     1#
ESCAPE     1#
GETPRI     1#
GETSWR     1#
MULT       1#
NEWTST     1#
OCTGN   2031#  2037  2049  2061
OCTGON  1462#  1482  1502  1522  1542  1562
POP        1#
PUSH       1#
REPORT     1#
SETPRI     1#
SETUP      1#
SKIP       1#
SLASH      1#
SQUARE  1588#  1590  1602  1614  1626  1638  1650  1662
STARS      1#
SWRSU      1#
TYPBIN     1#
TYPDEC     1#
TYPNAM     1#
TYPNUM     1#
TYPOCS     1#
TYPOCT     1#
TYPTXT     1#
$$ESCA     1#
$$NEWT     1#
$$SKIP     1#
.EQUAT     1#
.HEADE     1#
.KT11      1#
.SETUP     1#
.SWRHI     1#
.SACTI     1#
.SAPTB     1#
.SAPTH     1#
.SAPTY     1#
.SASTA     1#
.SCATC     1#
.SCMTA     1#
.SDB2D     1#
.SDB2O     1#
.SDIV      1#
.SEOP      1#
.SERRO     1#
.SERRT     1#
.SMULT     1#
.SPOWE     1#
.SRAND     1#
.SRODE     1#
.SRODC     1#
.SREAD     1#
.SR2AZ     1#
```

```
.$SAVE      18
.$SB2D      18
.$SB2O      18
.$SCOP      18
.$SIZE      18
.$SUPR      18
.$TRAP      18
.$TYPB      18
.$TYPD      18
.$TYPE      18
.$TYPO      18
.$400A      18
.1170       18


. ABS.  012540     000

 ERRORS DETECTED:  0
 DEFAULT GLOBALS GENERATED:  0

 DDGTGB.BIN,DDGTGB.SEQ/SOL/CRF/NL:TOC=DDGTGB.SML,DDGTGB.P11
 RUN-TIME: 25 31 2 SECONDS
 RUN-TIME RATIO: 153/58=2.6
 CORE USED:  33K  (65 PAGES)
```

E05

Spooler runtime 8 Seconds, 37 KCS, 178 disk reads, 3 disk writes, 55 pages

[illegible] Date 03-Dec-76 09:42:05 Monitor IPC-0 602 [680] ##END##