GT40-41-42-44

VISUAL DISPLAY TEST

MD-11-DDGTG-A

EP DDGTG A DL A

OCT 1976

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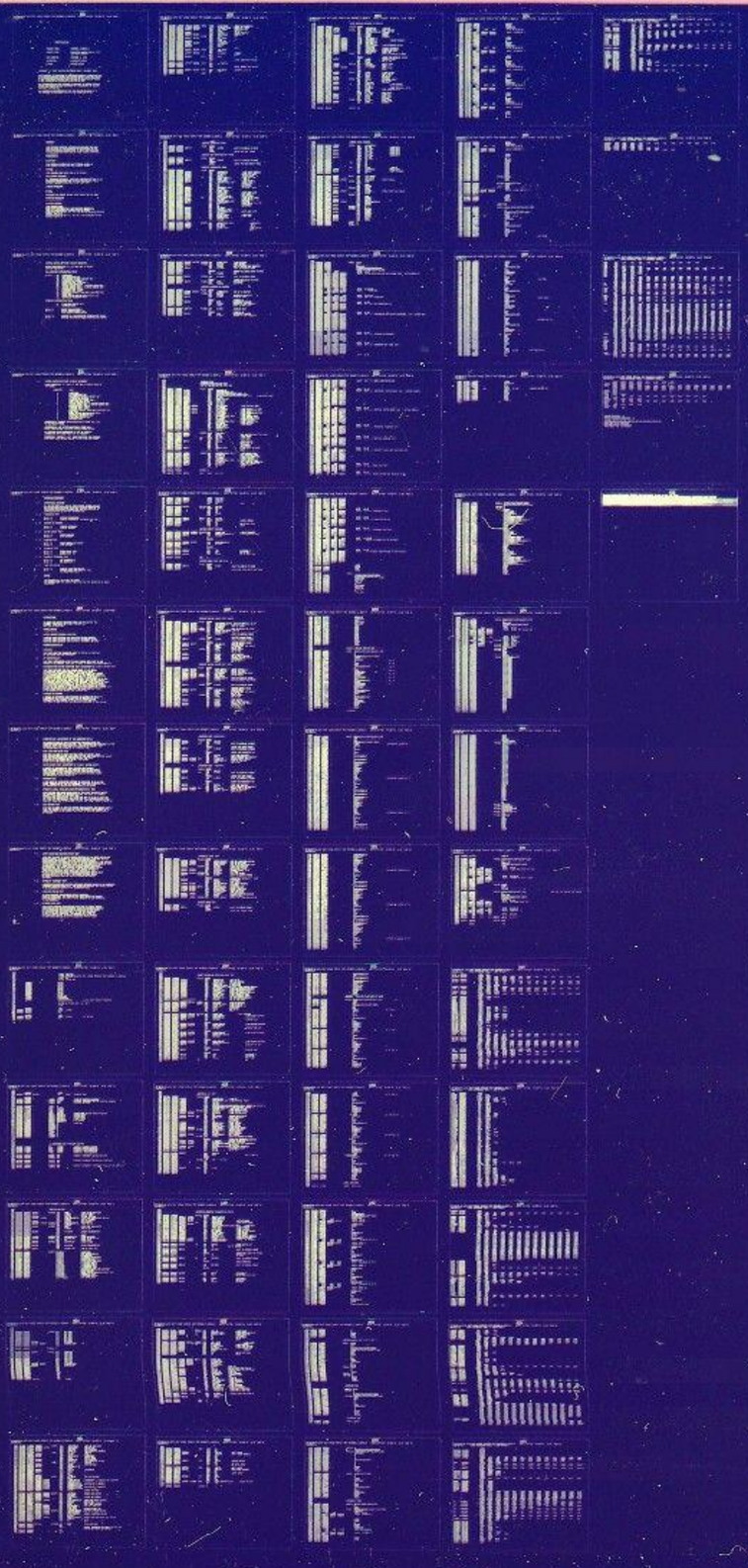

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IDENTIFICATION

PRODUCT CODE:	MAINDEC-11-DDGTG-A
PRODUCT NAME:	GT40/GT44 VISUAL DISPLAY TEST WITH VR17 DISPLAY
DATE CREATED:	NOVEMBER 1, 1973
MAINTAINER:	DIAGNOSTIC GROUP
AUTHOR:	RAYMOND SHOOP

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1. ABSTRACT

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 SPECIFIEC 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 VISIBLE 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 DRAWN 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 ORIGIN TO THE OPPOSITE EDGE OF THE SCREEN. THESE VECTORS SHOULD TERMINATE ON THE LINE DRAWED 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 CRUSS-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.

```
356                     .LIST
357
358
```

```
                                        .ENABL  ABS,AMA
                                        .TITLE GT-40/GT-44 WITH VR17 VISUAL DISPLAY TEST MAINDEC-11-DDGTG-A
                                        .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
        000500                          STKPTR=500
        177570                          DISPLAY=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
```

```
                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  177[illegible]2                 TKB:    177[illegible]2
001016  012470                          DBUF:   BUFFER          ;FIRST WORD IN THE DISPLAY BUFFER
001020  012472                          DBUF1:  BUFFER+2        ;SECOND WORD
001022  012474                          DBUF2:  BUFFER+4        ;THIRD WORD
001024  012476                          DBUF3:  BUFFER+6        ;FOURTH WORD
001026  012[illegible]0                 DBUF4:  BUFFER+10       ;FIFTH WORD
001030  012[illegible]2                 DBUF5:  BUFFER+12
001032  0[illegible]0                   DSAVE:  0               ;TEMP REG.
001034  0[illegible]00                  DSAVE1: 0
001036  0[illegible]0                   DSAVE2: 0
001040  0[illegible]0                   DSAVE3: 0
001042  0[illegible]0                   HOLD:   0
001044  0[illegible]0                   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  172[illegible]2                 DSR:    172002          ;DISPLAY STATUS REGISTER
001060  172[illegible]4                 XPOS:   172004          ;DISPLAY X AXIS REGISTER
001062  172006                          YPOS:   172006          ;DISPLAY Y AXIS REGISTER

001064  0[illegible]32C                 DDONE:  320             ;DISPLAY INTERRUPT VECTOR FOR STOP
001066  0[illegible]22                  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  002046          SCOPEA: TST     KRBD            ;TEST IF SW OR "KRB"
001104  001014                          BNE     SCOPEF          ;BR IF "KRB"
001106  005037  005556                  CLR     SWITCH          ;CLEAR "SWITCH"
001112  032737  000100  177570          BIT     #100,@#DISPLAY  ;TEST FOR "HOLD/STOP SWITCH"
001120  001402                          BEQ     SCOPEE          ;BR IF CLEARED
001122  005137  005556                  COM     SWITCH          ;SET SWITCH
001126  032737  000400  177570  SCOPEE: BIT     #400,@#DISPLAY  ;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  013704  177570          SCOPEB: MOV     @#DISPLAY,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  002052                  DISPTC: FILE0+2                 ;DIRECTORY
001212  002064                          FILE1+2                 ;DOT REPEATIBILITY
001214  002076                          FILE2+2                 ;PINCUSHION
001216  002342                          FILE3+2                 ;OCTAGONS OR SQUARES
001220  002416                          FILE4+2                 ;CHARACTER SET
001222  003026                          FILE5+2                 ;DASH LINES AND BLINK
001224  003040                          FILE6+2                 ;X VECTOR LENGTH
001226  003172                          FILE7+2                 ;Y VECTOR LENGTH
001230  003324                          FILE10+2                ;X PHOSPHOR TEST
001232  003400                          FILE11+2                ;Y PHOSPHOR TEST
001234  003454                          FILE12+2                ;INTENSITY LEVEL AND LIGHTPEN
001236  003616                          FILE13+2                ;EDGE SQUARES
001240  003630                          FILE14+2                ;SHORT VECTOR RELATIVE POINT TEST
001242  004110                          FILE15+2                ;GRAPHPLOT TEST
001244  004344                          FILE16+2                ;LIGHT-PEN FOLLOW
001246  005054                          FILE17+2                ;KEY BOARD ECHO
```

```
001250  010046                  LOWPWR: MOV     R0,-(SP)
001252  010146                          MOV     R1,-(SP)
001254  010246                          MOV     R2,-(SP)
001256  010346                          MOV     R3,-(SP)
001260  010446                          MOV     R4,-(SP)
001262  010546                          MOV     R5,-(SP)
001264  010637  001300                  MOV     SP,LOWSV
001270  012737  001302  000024          MOV     #HIGPWR,@#24
001276  000000                          HALT

001300  000000                  LOWSV:  0

001302  013706  001300          HIGPWR: MOV     LOWSV,SP
001306  012605                          MOV     (SP)+,R5
001310  012604                          MOV     (SP)+,R4
001312  012603                          MOV     (SP)+,R3
001314  012602                          MOV     (SP)+,R2
001316  012601                          MOV     (SP)+,R1
001320  012600                          MOV     (SP)+,R0
001322  012737  001250  000024          MOV     #LOWPWR,@#24
001330  012706  000500                  MOV     #STKPTR,SP
001334  000240                          NOP
001336  000240                          NOP
001340  000240                          NOP
001342  000000                          HALT
001344  000240                          NOP
001346  000240                          NOP
001350  000240                          NOP
001352  000137  001170                  JMP     SCOPED
```

```
001356  012706  000500                 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  005556                         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  012004                 MOV     #1000,RAY14A    ;HOUSEKEEP X,Y ORIGIN FOR LIGHTPEN
001474  012737  000600  012006                 MOV     #600,RAY14B
001502  012737  030060  011764                 MOV     #30060,DLT14A   ;INITIALIZE X READOUT
001510  012737  030060  011766                 MOV     #30060,DLT14A+2
001516  012737  030060  011776                 MOV     #30060,DLT14B   ;INITIALIZE Y READOUT
001524  012737  030060  012000                 MOV     #30060,DLT14B+2
001532  000137  000560                         JMP     FILED           ;START THE TEST

001536  012737  000062  000060          SETUP: MOV     #62,@#60        ;RESET KRB VECTOR
001544  012737  000000  000062                 MOV     #0,@#62
001552  052777  000100  177232                 BIS     #100,@TKS       ;CLEAR INT ENABLE
001560  005037  002046                         CLR     KRB0
001564  032737  000200  177570                 BIT     #200,@#DISPLAY  ;TEST FOR "KRB" CONTROL
001572  001413                                 BEQ     SETUPA          ;BR IF NOT
001574  005137  002046                         COM     KRB0            ;SET "KRB" CONTROL
001600  012737  001700  000060                 MOV     #RETB,@#60      ;SET UP "KRB" INT
001606  012737  000340  000062                 MOV     #340,@#62
001614  052777  000100  177170                 BIS     #100,@TKS       ;ENABLE "KRB" INT
001622  012777  001664  177234          SETUPA: MOV    #SETUPB,@DDONE  ;SET UP GT DONE VECTOR
001630  012777  000340  177230                 MOV     #340,@DDONE1
001636  013777  001072  177224                 MOV     LPVCT1,@LPVCT   ;RESET LIGHT-PEN VECTOR
001644  005077  177222                         CLR     @LPVCT1
001650  013777  001076  177216                 MOV     TMEVT1,@TIMEVT  ;RESET TIME-OUT/SHIFT OUT VECTOR
001656  005077  177214                         CLR     @TMEVT1
001662  000207                                 RTS     PC              ;EXIT

001664  005777  177166          SETUPB: TST    @DSR            ;TEST FOR STOP
001670  100401                                 BMI     .+4
001672  000000                                 HALT                    ;ERROR, INTERRUPT OCCURRED TO THE STOP
                                                                       ;VECTOR BUT STOP WAS NOT SET
001674  000002                                 RTI
001676  000000                                 HALT
```

```
001700  117737  177110  001044  RETB:   MOVB    @TKB,TSAVE      ;READ THE CHARACTER
001706  042737  177600  001044          BIC     #177600,TSAVE   ;MASK TO 7 BITS
001714  022737  000015  001044          CMP     #15,TSAVE       ;TEST FOR "CR"
001722  001440                          BEQ     KYT3            ;BR IF
001724  005037  005556                  CLR     SWITCH          ;CLEAR "SWITCH"
001730  162737  000101  001044          SUB     #101,TSAVE      ;MAKE 0-77
001736  100426                  KYT5:   BMI     KYT1            ;<A
001740  022737  000017  001044          CMP     #17,TSAVE
001746  100412                          BMI     KYT2            ;>P
001750  013704  001044                  MOV     TSAVE,R4
001754  012737  177777  001050          MOV     #-1,CHANGE
001762  005037  005556                  CLR     SWITCH
001766  005037  001042                  CLR     HOLD
001772  000002                          RTI                     ;EXIT
001774  022737  000076  001044  KYT2:   CMP     #76,TSAVE
002002  001015                          BNE     KYT4
002004  012737  177777  001042          MOV     #-1,HOLD        ; RUBOUT
002012  000002                          RTI                     ;EXIT
002014  005037  001042          KYT1:   CLR     HOLD
002020  000002                          RTI
002022  000000                          HALT                    ;FATAL ERROR RTI FAILED

002024  012737  177777  005556  KYT3:   MOV     #-1,SWITCH
002032  000002                          RTI
002034  000000                          HALT                    ;FATAL ERROR, RTI FAILED

002036  162737  000040  001044  KYT4:   SUB     #40,TSAVE       ;CONVERT LC TO UC
002044  000734                          BR      KYT5
002046  000000                  KRBD:   0
```

```
                                        .LIST
                                ;EXECUTE DIRECTORY FRAME

002050  104000                  FILE0:  SCOPE
00[illegible]2  004537  005412          JSR     5,MESG          ;EXIT TO DISPLAY A FRAME
00[illegible]6  001000                  1000
002060  005560                          FRME0                   ;USING THE DIR. FRAME

                                ;EXECUTE DOT REPEATIBILITY FRAME

002062  104000                  FILE1:  SCOPE
002064  004537  005412                  JSR     5,MESG          ;EXIT TO DISPLAY A FRAME
002070  100000                          100000
002072  007140                          FRME1                   ;USING THE DOR REPEAT FRAME

                                ;EXECUTE PINCUSHION FRAME

002074  104000                  FILE2:  SCOPE
002076  012700  012470                  MOV     #BUFFER,R0              ;LOAD START ADDRESS
002102  004737  002252                  JSR     PC,SETPNT               ;LOAD 0,0 ORIGIN
002106  012701  000020                  MOV     #20,R1                  ;SETUP COUNT
002112  012720  040000          1$:     MOV     #INTX,(R0)+             ;LOAD INT LINE
002116  012720  001777                  MOV     #MAXY,(R0)+             ; MAX Y
002122  012720  000100                  MOV     #100,(R0)+              ;LOAD DELTA X
002126  012720  021777                  MOV     #MINUSX+MAXY,(R0)+      ;LOAD - MAX Y
002132  005301                          DEC     R1                      ;FINISHED ?
002134  001[illegible]6                 BNE     1$                      ;BR IF NOT
002136  012720  020001                  MOV     #MINUSX+1,(R0)+         ;GO BACK 1 UNIT
002142  012720  000000                  MOV     #0,(R0)+
002146  012720  040000                  MOV     #INTX,(R0)+
002152  012720  001777                  MOV     #MAXY,(R0)+             ;PLOT LAST LINE
002156  004737  002252                  JSR     PC,SETPNT               ;SET ORIGIN
002162  012701  000020                  MOV     #MAXY+1/100,R1          ;SETUP COUNT
002166  012720  041777          2$:     MOV     #INTX+MAXX,(R0)+        ;LOAD DELTA X MAX
002172  012720  000000                  MOV     #0,(R0)+                ;LOAD DELTA Y = 0
002176  012720  021777                  MOV     #MINUSX+MAXX,(R0)+      ;RETRACE
[illegible]     012720  000100                  MOV     #100,(R0)+              ;LOAD DELTA Y OF 100
[illegible]     005301                          DEC     R1                      ;FINISHED ?
[illegible]     001[illegible]6                 BNE     2$                      ;BR IF NOT
[illegible]     0[illegible]3   000000          MOV     #0,(R0)+
[illegible]     0[illegible]20  020001          MOV     #MINUSX+1,(R0)+
[illegible]     0[illegible]20  041777          MOV     #INTX+MAXX,(R0)+        ;PLOT LAST LINE
[illegible]     0[illegible]20  000000          MOV     #0,(R0)+
[illegible]     0[illegible]20  17[illegible]00  MOV     #OSTOP,(R0)+            ;LOAD STOP
[illegible]     0[illegible]20  160000          MOV     #OJMP,(R0)+             ;LOAD JUMP
[illegible]     012710  012470                  MOV     #BUFFER,(R0)
002246  000137  002274                  JMP     FILE2A

002252  012720  117000          SETPNT: MOV     #POINT!INT4,(R0)+               ;LOAD POINT
002256  012720  000000                  MOV     #0,(R0)+                        ; AT X
002262  012720  000000                  MOV     #0,(R0)+                        ; AT Y
002266  012720  110000                  MOV     #LONGV,(R0)+                    ;LONG VECTOR
002272  000207                          RTS     PC                              ;EXIT
```

```
645
646  002274  012737  004000  001046  FILE2A: MOV     #4000,CNTR      ;LOAD COUNTER
647  002302  005737  005556          FILE2B: TST     SWITCH          ;TEST SWITCH
648  002306  001405                          BEQ     FILE2C          ;BR IF SUBTEST NOT SELECTED
649  002310  004537  005412                  JSR     R5,MESG         ;EXIT TO DISPLAY FRAME
650  002314  000001                          1
651  002316  012470                          BUFFER                  ;USING THE CROSS HATCH PATTERN
652  002320  000404                          BR      FILE2D          ;BR
653
654  002322  004537  005412          FILE2C: JSR     R5,MESG         ;EXIT TO DISPLAY FRAME
655  002326  000001                          1
656  002330  007230                          FRME2                   ;USING THE OFFSET PATTERN
657  002332  005337  001046          FILE2D: DEC     CNTR            ;FINISHED ?
658  002336  001361                          BNE     FILE2B          ;BR IF NOT
659
660                                  ;EXECUTE OCTAGONS OR SQUARES
661
662  002340  104000                  FILE3:  SCOPE
663  002342  012737  014000  001046          MOV     #14000,CNTR     ;SET UP A COUNTER
664  002350  005737  005556          FILE3A: TST     SWITCH
665  002354  001010                          BNE     FILE3B          ;BRANCH IF SUB-TEST
666  002356  004537  005412                  JSR     5,MESG          ;DISPLAY TEST
667  002362  000001                          1
668  002364  007334                          FRME3                   ;FRAME # 3
669  002366  005337  001046                  DEC     CNTR            ;DECREMENT COUNTER
670  002372  001366                          BNE     FILE3A          ;BRANCH IF NOT COMPLETE
671  002374  000407                          BR      FILE4           ;EXIT TO NEXT TEST
672
673  002376  004537  005412          FILE3B: JSR     5,MESG          ;DISPLAY TEST
674  002402  000001                          1
675  002404  007724                          FRME3A                  ;FRAME # 3A
676  002406  005337  001046                  DEC     CNTR            ;DECREMENT COUNTER
677  002412  001356                          BNE     FILE3A          ;BRANCH IF NOT COMPLETE
```

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

002414  104000                          FILE4:  SCOPE
002416  012700  012470                          MOV     #BUFFER,R0
002422  012720  174400                          MOV     #STATSB!SIZEO,(0)+
002426  012720  170052                          MOV     #STATSA!ITALO!SYNOFF!GREEN,(0)+
002432  012720  117124                          MOV     #POINT!INT4!LPOFF!BLKOFF!LINEO,(0)+     ;LOAD POINT MODE
002436  012720  000000                          MOV     #0,(0)+
002442  012720  001700                          MOV     #MAXY-77,(0)+
002446  012720  100000                          MOV     #CHAR,(0)+
002452  112720  000017                          MOVB    #17,(0)+
002456  112720  000017                          MOVB    #17,(0)+
002462  012737  000100  002666                  MOV     #100,STCHAR             ;LOAD INITIAL CHAR.
002470  004737  002624                          JSR     PC,LOADBF
002474  012737  000140  002666                  MOV     #140,STCHAR             ;LOAD INITIAL LC CHAR
002502  004737  002624                          JSR     PC,LOADBF               ;LOAD LINE
002506  012737  000040  002666                  MOV     #40,STCHAR              ;LOAD NUMBERS AND PUNCT
002514  004737  002624                          JSR     PC,LOADBF               ;LOAD LINE
002520  012720  170040                          MOV     #STATSA!ITALO,(R0)+     ;LOAD NORMAL FONT
002524  004737  002664                          JSR     PC,LOADSP               ;LOAD SPECIAL CHARS
002530  004737  002730                          JSR     PC,SPACE                ;INSERT SPACES
002534  012720  170060                          MOV     #STATSA!ITAL1,(R0)+     ;LOAD ITALICS FONT
002540  004737  002664                          JSR     PC,LOADSP               ;LOAD SPECIAL
002544  012720  175400                          MOV     #DSTOP,(R0)+            ;LOAD DSTOP
002550  012720  160000                          MOV     #DJMP,(R0)+
002554  012720  012470                          MOV     #BUFFER,(R0)+
002560  000137  002746                          JMP     FILE4A

002564  112720  000016                  LOADSP: MOVB    #16,(R0)+
002570  012702  000030                          MOV     #0,R2                   ;SET INITIAL SHIFT OUT CHAR
002574  012703  000037                          MOV     #37,R3                  ;LOAD COUNT
002600  110220                          1$:     MOVB    R2,(R0)+                ;LOAD CHAR
002602  005202                          2$:     INC     R2
002604  012702  000017                          CMP     #17,R2                  ;TEST FOR SI
002610  001774                                  BEQ     2$                      ;BR IF SI "17"
002612  005303                                  DEC     R3                      ;FINISHED ?
002614  001371                                  BNE     1$                      ;BR IF NOT
002616  012720  020017                          MOV     #20017,(R0)+            ;LOAD SHIFT-IN SPACE
002622  000207                                  RTS     PC                      ;EXIT

002624  012720  170040                  LOADBF: MOV     #STATSA!ITALO,(R0)+     ;LOAD NORMAL FONT
002630  013702  002666                          MOV     STCHAR,R2               ;GET STARTING CHAR
002634  004737  002712                          JSR     PC,FILLIT               ;LOAD THE CHARACTERS
002640  004737  002730                          JSR     PC,SPACE                ;INSERT SPACES
002644  012720  170060                          MOV     #STATSA!ITAL1,(R0)+     ;LOAD ITALICS FONT
002650  013702  002666                          MOV     STCHAR,R2               ;GET STARTING CHARACTER
002654  004737  002712                          JSR     PC,FILLIT               ;LOAD THE CHARACTERS
002660  004737  002670                          JSR     PC,CRLF                 ;INSERT CR-LF
002664  000207                                  RTS     PC                      ;EXIT

002666  000000                          STCHAR: 0

002670  112720  000015                  CRLF:   MOVB    #15,(0)+
```

```
002674  112720  000012                  MOVB    #12,(0)+
002700  112720  000012                  MOVB    #12,(0)+
002704  112720  000012                  MOVB    #12,(0)+
002710  000207                          RTS     PC                          ;EXIT

002712  012703  000040          FILLIT: MOV     #40,R3
002716  110220                  FILLA:  MOVB    R2,(0)+
002720  005202                          INC     R2
002722  005303                          DEC     R3
002724  001374                          BNE     FILLA
002726  000207                          RTS     7

002730  012703  000010          SPACE:  MOV     #10,R3
002734  112720  000040          1$:     MOVB    #40,(R0)+                   ;LOAD A SPACE
002740  005303                          DEC     R3
002742  001374                          BNE     1$                          ;BR IF NOT DONE
002744  000207                          RTS     PC                          ;EXIT

                                ;ACTUAL DISPLAY ROUTINE

002746  012737  001000  003022  FILE4A: MOV     #1000,10$                   ;LOAD A COUNTER
002754  012737  001700  012500  4$:     MOV     #MAXY-77,BUFFER+10          ;LOAD STARTING POINT
002762  004537  005412                  JSR     R5,MESG
002766  000001                          1
002770  012470                          BUFFER

002772  012737  000400  012500          MOV     #400,BUFFER+10
003000  004537  005412                  JSR     R5,MESG
003004  000001                          1
003006  012470                          BUFFER

003010  005337  003022                  DEC     10$                         ;FINISHED ?
003014  001357                          BNE     4$                          ;BR IF NOT
003016  000137  003024                  JMP     FILE5                       ;GO TO NEXT TEST

003022  000000                  10$:    0

                                ;EXECUTE DASH LINES AND BLINK

003024  104000                  FILE5:  SCOPE
003026  004537  005412                  JSR     5,MESG          ;EXIT TO DISPLAY A FRAME
003032  010000                          10000
003034  010174                          FRME5                   ;USING THE DASH AND BLINK FRAME
```

```
                                        ;EXECUTE VECTOR LENGTH TEST (HORIZ)

003176  104000                          FILE6:  SCOPE
003200  012737  041777  010472                  MOV     #INTX!MAXX,DELTX6 ;SET UP VERTICAL HEIGHT
003206  012737  000010  001036                  MOV     #10,DSAVE2        ;SET UP TIMER
003214  012737  000010  001034                  MOV     #0,DSAVE1
003222  012737  000040  001046          LOOPA:  MOV     #40,CNTR          ;SET UP EXECUTION COUNT
003230  012737  000010  001032          LOOPA1: MOV     #MAXY+1/10,DSAVE  ;SET UP
003236  012737  000034  010474                  MOV     DSAVE1,DELTY6
003244  004737  005412                          JSR     5,MESG            ;EXIT TO DISPLAY FRAME
003250  000001                                  1
003252  000005                                  FRME6                     ;VECTOR LENGTH FRAME
003254  004737  005412                  LOOPA2: JSR     5,MESG            ;EXIT TO DISPLAY FRAME
003260  000001                                  1
003262  000005                                  FRME6A                    ;VECTOR LENGTH FRAME
003264  012737  000010  010474                  ADD     #10,DELTY6        ;UPDATE ANGLE
003272  005337  001032                          DEC     DSAVE             ;FINISHED ALL THE ANGLES
003276  001366                                  BNE     LOOPA2            ;BR IF NOT
003300  005337  001046                  LOOPA3: DEC     CNTR              ;DONE COUNT?
003304  001351                                  BNE     LOOPA1            ;BR IF NOT
003306  000240                                  NOP
003308  005737  005556                          TST     SWITCH            ;TEST SWITCH
003314  001342                                  BNE     LOOPA             ;BR IF HALT MOTION
003316  005237  001034                          INC     DSAVE1            ;UPDATE INITIAL ANGLE
003322  005337  001036                          DEC     DSAVE2            ;FINISHED ALL?
003326  001335                                  BNE     LOOPA             ;BR IF NOT

                                        ;EXECUTE VECTOR LENGTH TEST (VERT)

003170  104000                          FILE7:  SCOPE
003172  012737  040000  001034                  MOV     #INTX,DSAVE1      ;SETUP INITIAL X
003200  012737  001777  010474                  MOV     #MAXY,DELTY6      ;SETUP INITIAL Y
003206  012737  000010  001036                  MOV     #10,DSAVE2        ;SETUP EXECUTION COUNT
003214  012737  000040  001046          LOOPB:  MOV     #40,CNTR          ;SETUP DELAY
003222  012737  000200  001032          LOOPB1: MOV     #200,DSAVE
003230  012737  001034  010472                  MOV     DSAVE1,DELTX6     ;EXIT TO DISPLAY FRAME
003236  004737  005412                          JSR     5,MESG            ;VECTOR LENGTH TEST FRAME
003242  000001                                  1
003244  000006                                  FRME6
003246  004737  005412                  LOOPB2: JSR     5,MESG            ;EXIT TO DISPLAY FRAME
003252  000001                                  1
003254  010462                                  FRME6A                    ;VECTOR LENGTH FRAME
003256  012737  000010  010472                  ADD     #10,DELTX6        ;UPDATE ANGLE
003264  005337  001032                          DEC     DSAVE             ;FINISHED ALL THE ANGLES
003270  001366                                  BNE     LOOPB2            ;BR IF NOT
003272  005337  001046                  LOOPB3: DEC     CNTR              ;DONE COUNT?
003276  001351                                  BNE     LOOPB1            ;BR IF NOT
003300  000240                                  NOP
003302  005737  005556                          TST     SWITCH            ;TEST SWITCH
003306  001342                                  BNE     LOOPB             ;BR IF HALT MOTION
003310  005237  001034                          INC     DSAVE1            ;UPDATE INITIAL ANGLE
003314  005337  001036                          DEC     DSAVE2            ;FINISHED ALL?
003320  001335                                  BNE     LOOPB             ;BR IF NOT
```

```
                                        ;PHOSPHOR TEST (HORIZONTAL)

003322  104000                          FILE10: SCOPE
00[illegible]4  00[illegible]37  010506          CLR     DELTX7
0[illegible]0  0[illegible]37  005412          D7A:    JSR     5,MESG          ;EXIT TO DISPLAY A FRAME
00[illegible]34  00[illegible]0                         50
[illegible]6  0[illegible]4                             FRME10                  ;USING THE HORIZ FRAME
[illegible]0  0[illegible]37  005412                    JSR     5,MESG          ;EXIT TO DISPLAY A FRAME
[illegible]44  0[illegible]01                           1
[illegible]6  0[illegible]4                             FRM10                   ;USING THE PERIMETER BOX
[illegible]0                                            NOP
[illegible]2  0[illegible]737  005556                   TST     SWITCH          ;TEST THE "SWITCH"
[illegible]6  001364                                    BNE     D7A             ;BR IF FREEZE THE MOVEMENT
0[illegible]0  0[illegible]2737  000001  010506  D7C:   ADD     #1,DELTX7       ;UPDATE THE X ORIGIN
0[illegible]6  0[illegible]2737  002000  010506        CMP     #2000,DELTX7    ;TEST IF THE END
003374  001355                                          BNE     D7A             ;BR IF NOT

                                        ;PHOSPHOR TEST  (VERTICAL)

003376  104000                          FILE11: SCOPE
003400  005037  010550                          CLR     DELTY7
003404  004537  005412          D7D:    JSR     5,MESG          ;EXIT TO DISPLAY A FRAME
003410  000050                          50
003412  010544                          FRME11                  ;USING THE VERT FRAME
003414  004537  005412                  JSR     5,MESG          ;EXIT TO DISPLAY A FRAME
003420  000001                          1
003422  010604                          FRM10                   ;USING THE PERIMETER BOX
003424  000240                          NOP
003426  005737  005556                  TST     SWITCH          ;TEST THE "SWITCH"
003432  001364                          BNE     D7D             ;BR IF FREEZE THE MOVEMENT
003434  062737  000001  010550  D7F:    ADD     #1,DELTY7       ;UPDATE THE Y ORIGIN
003442  022737  002000  010550          CMP     #MAXY+1,DELTY7  ;TEST IF THE END
003450  001355                          BNE     D7D             ;BR IF NOT
```

```
                                        ;INTENSITY LEVEL TEST

003452  104000                  FILE12: SCOPE
003454  012777  003550  175406          MOV     #RETLP,@LPVCT           ;SET UP LIGHT-PEN VECTOR
003462  013777  001004  175432          MOV     [illegible],@LPVCT1     ;SET UP BR LEVEL
003470  012737  004000  001032          MOV     #4000,DSAVE             ;SET UP A EXECUTION COUNT
003476  005737  005556          FLE12A: TST     SWITCH                  ;TEST THE "SWITCH"
003502  001004                          BNE     FLE12B                  ;BR IF SET "SYNC"
003504  042737  000004  010650          BIC     #4,SYN12                ;ENSURE CLEAR "SYNC"
003512  000403                          BR      FLE12C                  ;BY PASS
003514  052737  000004  010650  FLE12B: BIS     #4,SYN12                ;SET THE "SYNC"
003522  004537  005412          FLE12C: JSR     5,MESG                  ;EXIT TO DISPLAY FRAME
003526  000001                          1
003530  010642                          FRME12                          ;USING THE "INTENSITY" FRAME
003532  005337  001032                  DEC     DSAVE                   ;FINISHED?
003536  001423                          BEQ     FLE.2D                  ;YES, EXIT
003540  012737  173400  011250          MOV     #DSTOP,RAYLPA           ;NO, RESET MESSAGE
003546  000753                          BR      FLE12A                  ;BR BACK
003550  012737  164000  011250  RETLP:  MOV     #DNOP,RAYLPA            ;LIGHT-PEN HIT
[illegible]  017737  175300  011262          MOV     @YPOS,LPPNT             ;READ Y POSITION
[illegible]  042737  176000  011262          BIC     #176000,LPPNT           ;MASK THE BITS
[illegible]  022626                          CMP     (SP)+,(SP)+             ;POP THE STACK
[illegible]  012777  000001  175252          MOV     #1,@DPC                 ;SINGLE STEP THE DISPLAY
[illegible]  000137  005430                  JMP     MESGA                   ;JUMP TO WAIT
003606  013777  001072  175254  FLE12D: MOV     LPVCT1,@LPVCT           ;RESET THE LIGHT-PEN VECTOR


                                        ;EXECUTE EDGE TEST

003614  104000                  FILE13: SCOPE
003616  004537  005412                  JSR     5,MESG                  ;EXIT TO DISPLAY FRAME
003622  010000                          10000
003624  011312                          FRME13                          ;USING THE "EDGE" FRAME
```

```
                                        ;SHORT VECTOR AND RELATIVE POINT TEST

003626  104000                          FILE14: SCOPE
003630  012700  012470                          MOV     #BUFFER,R0          ;SET UP R0
003634  012720  114000                          MOV     #POINT,(0)+         ;SET UP INITIAL
003640  012720  000240                          MOV     #240,(0)+           ;X POSITION
003644  012720  001000                          MOV     #MAXY+1/2,(0)+      ;Y POSITION
003650  012720  107004                          MOV     #SHORTV!INT4!LINE0,(0)+ ;LOAD "SHORT VECTOR"
003654  004737  003706                          JSR     PC,LOADVT           ;LOAD THE DISPLAY PATTERN
003660  012720  130000                          MOV     #RELATV,(0)+        ;LOAD "RELATIVE POINT"
003664  004737  003706                          JSR     PC,LOADVT           ;LOAD THE DISPLAY PATTERN
003670  012720  173400                          MOV     #OSTOP,(0)+         ;LOAD "DISPLAY STOP"
003674  012720  160000                          MOV     #OJMP,(0)+          ;LOAD "DISPLAY JUMP"
003700  012720  012470                          MOV     #BUFFER,(0)+        ;TO THE BUFFER ADDRESS
003704  000413                                  BR      FIL14A              ;BR TO THE FRAME

003706  012737  000024  001046  LOADVT: MOV     #24,CNTR            ;LOAD A COUNTER
003714  012720  040077          LADVT:  MOV     #INTX+77,(0)+       ;LOAD A DELTA Y
003720  012720  004177                  MOV     #4177,(0)+          ;LOAD A DELTA X,Y
003724  005337  001046                  DEC     CNTR                ;FINISHED?
003730  001371                          BNE     LADVT               ;BR IF NOT
003732  000207                          RTS     PC                  ;EXIT

003734  012737  004000  004104  FIL14A: MOV     #4000,10$                   ;LOAD COUNTER
003742  012737  000200  011572  1$:     MOV     #200,FRM14A                         ;LOAD FIRST OCTAGON
003750  012737  000200  011574          MOV     #200,FRM14B
003756  004537  005412                  JSR     R5,MESG                             ;DISPLAY OCT.
003762  000001                          1
003764  011566                          FRME14
003766  012737  001400  011572          MOV     #1400,FRM14A                        ;LOAD SECOND OCTAGON
003774  012737  000200  011574          MOV     #200,FRM14B
004002  004537  005412                  JSR     R5,MESG                             ;DISPLAY 2ND OCT.
004006  000001                          1
004010  011566                          FRME14
004012  012737  001400  011572          MOV     #1400,FRM14A                        ;LOAD THIRD OCTAGON
004020  012737  001400  011574          MOV     #MAXY-377,FRM14B
004026  004537  005412                  JSR     R5,MESG
004032  000001                          1
004034  011566                          FRME14
004036  012737  000200  011572          MOV     #200,FRM14A                         ;LOAD FOURTH OCTAGON
004044  012737  001400  011574          MOV     #MAXY-377,FRM14B
004052  004537  005412                  JSR     R5,MESG                             ;DISPLAY 4TH OCT.
004056  000001                          1
004060  011566                          FRME14
004062  004537  005412                  JSR     R5,MESG                             ;DISPLAY BAR
004066  000001                          1
004070  012470                          BUFFER
004072  005337  004104                  DEC     10$                                 ;FINISHED ?
004076  001321                          BNE     1$                                  ;BR IF NOT
004100  000137  004106                  JMP     FILE15                              ;NEXT TEST
004104  000000                  10$:    0
```

```
                                        ;GRAPHPLOT X-Y TEST

004106  104000                  FILE15: SCOPE
004110  012700  012470                  MOV     #BUFFER,R0          ;LOAD R0
004114  012220  117[illegible]0                 MOV     #POINT!INT7,(0)+;LOAD INITIAL POINT
004120  012720  000[illegible]0                 MOV     #0,(0)+
004124  012720  00[illegible]00                 MOV     #0,(0)+
004130  012720  1[illegible]052                 MOV     #STATSB!ITBLO!SYNOFF!GREEN,(R0)+ ;RESET THE STATUS A
004134  012720  174100                          MOV     #STATSB!INCR,(0)+ ;LOAD INITIAL STATUS B
004140  012720  12[illegible]00                 MOV     #GRAPHX,(0)+        ;LOAD GRAPH X INST
004144  012705  00[illegible]40         DFL15C: MOV     #40,R5              ;LOAD STARTUP COUNT
004150  012737  00[illegible]00  001032         MOV     #0,DSAVE            ;LOAD INITIAL PLOT
004156  000403                                  BR      2$
004160  062737  000020  001032  1$:     ADD     #20,DSAVE           ;UPDATE PLOT POINT
004166  013[illegible]0  001032  2$:     MOV     DSAVE,(0)+          ;SAVE THE POINT
004172  005[illegible]5                         DEC     R5                  ;FINISHED?
004174  001371                                  BNE     1$                  ;BR IF NOT
004176  012[illegible]0  173400                 MOV     #DSTOP,(0)+         ;LOAD "DSTOP"
[illegible]2  012[illegible]0  1[illegible]00                 MOV     #DJMP,(0)+          ;LOAD "DJMP"
004[illegible]6  012720  01[illegible]70                 MOV     #BUFFER,(0)+        ;LOAD RETURN
004212  012737  00[illegible]200  001032         MOV     #200,DSAVE          ;LOAD POINT COUNT
004[illegible]0  042777  004000  174602  DFL15D: BIC     #4000,@DBUF5        ;ENSURE "GRAPHX"
004[illegible]6  005737  005556                  TST     S[illegible]TCH             ;TEST SWITCH
00[illegible]2  001403                          BEQ     D[illegible]L15B            ;BR IF GRAPHX
00[illegible]4  052777  004000  174566          BIS     #4000,@DBUF5        ;SET GRAPHY
004242  004537  005412          DFL15B: JSR     5,MESG              ;EXIT TO DISPLAY A FRAME
00[illegible]6  000001                          1
[illegible]0  012470                            BUFFER                      ;USING THE GENERATED PATTERN
0[illegible]2  062777  000001  174546           [illegible]D    #1,@DBUF4           ;UPDATE INCREMENT
0[illegible]0  02[illegible]777  174200  174540          CMP     #STATSB+200,@DBUF4 ;TEST IF LAST INCREMENT
0[illegible]6  001365                           BNE     DFL15B              ;BR IF NOT
0[illegible]70  012777  174100  174530          MOV     #STATSB!INCR,@DBUF4 ;RELOAD INCREMENT
0[illegible]76  0[illegible]5337  001032         DEC     DSAVE               ;FINISHED 10 SEC?
004302  001346                                  BNE     DFL15D              ;BR IF NOT

004304  013700  000042                          MOV     @#42,R0
004310  001407                                  BEQ     HERE                                ;ACT-11/DDP-11
004312  000005                                  RESET
004314  [illegible]5                            RESET
004316  0[illegible]710                 LOGICAL:        JSR     PC,(R0)
004320  0[illegible]240                         NOP
004322  0[illegible]240                         NOP
004[illegible]4  000240                         NOP
0[illegible]6  000240                           NOP
004330  000137  002050          HERE:   JMP     FILE0
004334  000240                          NOP
004336  000240                          NOP
004340  000240                          NOP
```

```
                                        ;OPERATOR OPERATOR INTERVENTION TESTS

004342  104000                  FILE16: SCOPE
004344  012777  004614  174516          MOV     #RET14,@LPVCT
004352  013777  001004  174512          MOV     @PC,@LPVCT1
004360  012737  000100  001034          MOV     #100,DSAVE1             ;SET UP COUNT
004366  012700  012470          1$:     MOV     #BUFFER,R0              ;LOAD START ADDR.
004372  012737  000100  001032          MOV     #100,DSAVE
004400  012720  117744                  MOV     #POINT!INT7!LPON!LINE0,(R0)+    ;LOAD POINT
004404  012720  000700                  MOV     #700,(R0)+              ;LOAD X POINT
004410  012720  000474                  MOV     #474,(R0)+              ;LOAD Y POINT
004414  004737  004556                  JSR     PC,LOADUP               ;LOAD UP THE BUFFER
004420  012720  173400                  MOV     #OSTOP,(R0)+            ;LOAD OSTOP
004424  012720  160000                  MOV     #OJMP,(R0)+             ;LOAD OJUMP
004430  012720  012470                  MOV     #BUFFER,(R0)+           ;LOAD RETURN ADDRESS
004434  005037  005050                  CLR     HITCNT                  ;CLEAR HIT COUNT
004440  012737  030060  012374          MOV     #30060,FRM16B-2         ;PRESET THE READOUT
004446  012737  030060  012372          MOV     #30060,FRM16B-4

004454  005737  005556          4$:     TST     SWITCH                  ;TEST SWITCH BIT
004460  001005                          BNE     6$              ;BR IF SUBTEST

004462  004537  005412                  JSR     R5,MESG                 ;EXIT TO DISPLAY FRAME
004466  000100                          100
004470  011714                          FRME16                          ;USINT THE LIGHT-PEN FRAME
004472  000770                          BR      4$                      ;BR BACK

004474  004537  005412          6$:     JSR     R5,MESG                 ;EXIT TO DISPLAY FRAME
004500  000001                          1
004502  012302                          FRM16A                          ;ASCII SUBTITLE

004504  004537  005412                  JSR     R5,MESG                 ;EXIT TO DISPLAY FRAME
004510  000001                          1
004512  012470                          BUFFER


004514  005337  001032                  DEC     DSAVE                   ;FINISHED ?
004520  001355                          BNE     4$                      ;BR IF NOT MINI-LOOP

004522  005337  001034                  DEC     DSAVE1                  ;FINISHED ?
004526  001317                          BNE     1$                      ;BR IF NOT
004530  000137  004342                  JMP     FILE16                  ;RESTART
```

```
004534  012701  000030                LOADAC: MOV     #24.,R1                 ;LOAD COUNT
004540  012720  130000                        MOV     #RELATV,(R0)+           ;LOAD RELATIVE POINT
004544  012720  040004                1$:     MOV     #INTX+4,(R0)+           ;LOAD INTEN BIT
004550  005301                                DEC     R1                      ;FINISHED ?
004552  001374                                BNE     1$                      ;BR IF NOT
004554  000207                                RTS     PC                      ;EXIT

004556  012737  000030  001046        LOADUP: MOV     #24.,CNTR                       ;LOAD COUNT
004564  004737  004534                1$:     JSR     PC,LOADAC               ;LOAD ACCRUSS
004570  012720  110000                        MOV     #LONGV,(R0)+            ;LOAD LONG VECTOR
004574  012720  000004                        MOV     #4,(R0)+                ;LOAD VECTOR OVER
004600  012720  020140                        MOV     #MINUSX+140,(R0)+               ;AND UP
004604  005337  001046                        DEC     CNTR
004610  001365                                BNE     1$                      ;BR IF NOT DONE
004612  000207                                RTS     PC                      ;EXIT


004614  017737  174242  004754        RET14:  MOV     @YPOS,40$
004622  042737  176000  004754                BIC     #176000,40$
004630  017737  174224  004756                MOV     @XPOS,41$
004636  042737  176000  004756                BIC     #176000,41$
004644  005737  005556                        TST     SWITCH          ;TEST SW
004650  001411                                BEQ     1$              ;BR IF LIGHT PEN FOLLOW
004652  005237  005050                        INC     HITCNT          ;UPDATE LIGHT PEN HIT COUNT
004656  013703  005050                        MOV     HITCNT,R3       ;LOAD R3
004662  012702  012376                        MOV     #FRM16B,R2      ;LOAD ADDRESS
004666  004737  005332                        JSR     PC,KBCHR        ;CONVERT OCTAL
004672  000432                                BR      20$             ;BR
004674  013703  004756                1$:     MOV     41$,R3          ;LOAD R3
004700  012702  011770                        MOV     #DLT14A+4,R2    ;LOAD ADDRESS
004704  004737  005332                        JSR     PC,KBCHR        ;LOAD X READOUT
004710  013703  004754                        MOV     40$,R3          ;LOAD R3
004714  012702  012002                        MOV     #DLT14B+4,R2    ;LOAD ADDRESS
004720  004737  005332                        JSR     PC,KBCHR        ;LOAD Y READOUT
004724  013737  004754  012006                MOV     40$,RAY14B      ;LOAD NEW Y POSITION
004732  013737  004756  012004                MOV     41$,RAY14A      ;LOAD NEW X POSITION
004740                                10$:
004740  012777  000001  174106                MOV     #1,@DPC         ;SINGLE STEP THE DISPLAY
004746  022626                                CMP     (SP)+,(SP)+
004750  000137  005430                        JMP     MESGA


004754  000000                        40$:    0
004756  000000                        41$:    0
```

N02


```
1091
1092  004760  005001                  20$:    CLR     R1
1093  004762  005002                          CLR     R2
1094  004764  013700  004756                  MOV     41$,R0          ;GET X AXIS
1095  004770  162700  000700                  SUB     #700,R0         ;GET A BASE ADDRESS
1096  004774  006200                          ASR     R0
1097  004776  006200                          ASR     R0
1098  005000  001404                          BEQ     30$
1099  005002  062701  000070          21$:    ADD     #70,R1          ;UPDATE OFFSET
1100  005006  005300                          DEC     R0
1101  005010  001374                          BNE     21$             ;BR UNTIL DONE
1102
1103  005012  013700  004754          30$:    MOV     40$,R0          ;GET X AXIS
1104  005016  162700  000500                  SUB     #500,R0         ;MAKE BASE ADDRESS
1105  005022  006200                          ASR     R0
1106  005024  006200                          ASR     R0              ;SHIFT RIGHT
1107  005026  001404                          BEQ     32$
1108  005030  062701  000002          31$:    ADD     #2,R1
1109  005034  005300                          DEC     R0
1110  005036  001374                          BNE     31$
1111  005040  042761  040000  012500  32$:    BIC     #INTX,BUFFER+10(R1)     ;CLEAR THE BIT
1112  005046  000734                          BR      10$
1113
1114  005050  000000                  HITCNT: 0
```

```
                                        ;ECHO ROUTINE KEYBOARD TO DISPLAY

005052  104000                  FILE17: SCOPE
005054  012700  012470                  MOV     #BUFFER,R0          ;LOAD R0
005060  012720  173400          ECHOA:  MOV     #DSTOP,(0)+         ;MOV "DSTOPS"
005064  022700  013470                  CMP     #BUFFER+1000,R0     ;THRUOUT THE
005070  001373                          BNE     ECHOA               ;BUFFER
005072  005037  001052                  CLR     LOKRB               ;HOUSE
005076  005037  001032                  CLR     DSAVE               ;KEEPING
005102  112737  000060  012461          MOVB    #60,KBOCT-4
005110  112737  000060  012462          MOVB    #60,KBOCT-3                 ;PRESET READOUT
005116  112737  000060  012463          MOVB    #60,KBOCT-2
005124  112737  000060  012464          MOVB    #60,KBOCT-1
005132  012737  005206  000060          MOV     #RET117,@#60        ;LOAD KEYBOARD VECTOR
005140  012737  000340  000062          MOV     #340,@#62
005146  052777  000100  173636          BIS     #100,@TKS           ;ENABLE INTERRUPT
005154  012737  000700  005330          MOV     #700,CHRCNT         ;LOAD CHAR COUNT
005162  012700  012470                  MOV     #BUFFER,R0          ;RESET R0
005166  004537  005412          ECHOC:  JSR     5,MESG              ;EXIT TO DISPLAY A FRAME
005172  000001                          1
005174  012404                          FRME17                      ;USING THE KEYBOARD HEADER
005176  005737  001052                  TST     LOKRB               ;UPDATE A CHAR?
005202  001012                          BNE     RET21               ;BR IF YES
005204  000770                          BR      ECHOC
005206  017701  173602          RET117: MOV     @TKB,R1             ;GET A CHAR
005212  042701  177600                  BIC     #177600,R1          ;MASK
005216  012737  177777  001052          MOV     #-1,LOKRB           ;SET (FLAG)
005224  000002                          RTI                         ;EXIT
005226  000000                          HALT
005230  005037  001052          RET21:  CLR     LOKRB               ;CLEAR (FLAG)
005234  022701  000003                  CMP     #3,R1               ;TEST FOR PC
005240  001002                          BNE     RET20               ;BR IF NOT
005242  000137  001456                  JMP     STRC                ;RESTART
005246  005337  005330          RET20:  DEC     CHRCNT              ;FINISHED COUNT?
005252  001002                          BNE     1$                  ;BR IF NOT
005254  000137  005054                  JMP     FILE17+2            ;RESTART
005260  012702  012465          1$:     MOV     #KBOCT,R2                   ;LOAD ADDRESS
005264  010103                          MOV     R1,R3
005266  004737  005332                  JSR     PC,KBCHR                    ;LOAD THE OCTAL VALUE
005272  005737  001032                  TST     DSAVE               ;TEST HIGH/LOW BYTE
005276  001007                          BNE     ECHOB
005300  110120                          MOVB    R1,(R0)+            ;SAVE BYTE
005302  112710  000017                  MOVB    #17,(R0)            ;SHIFT-IN
005306  005137  001032                  COM     DSAVE               ;COMP FLAG
005312  000137  005166                  JMP     ECHOC               ;BR BACK
005316  110120          ECHOB:  MOVB    R1,(0)+             ;SAVE CHAR
005320  005037  001032                  CLR     DSAVE               ;CLEAR FLAG
005324  000137  005166                  JMP     ECHOC               ;BR BACK

005330  000200          CHRCNT: 200
```

```
                                        ;UPDATE OCTAL READOUT

005332  042703  176000          KBCHR:  BIC     #176000,R3
005336  004737  005376                  JSR     PC,10$                  ;LOAD BITS
005342  110442                          MOVB    R4,-(R2)                ;SAVE BITS
005344  004737  005370                  JSR     PC,11$                  ;MOVE BITS
005350  110442                          MOVB    R4,-(R2)                ;  VE BITS
005352  004737  005370                  JSR     PC,11$                  ;MOVE BITS
005356  110442                          MOVB    R4,-(R2)                ;SAVE BITS
005360  004737  005370                  JSR     PC,11$
005364  110442                          MOVB    R4,-(R2)
005366  000207                          RTS     PC
005370  006003                  11$:    ROR     R3
005372  006003                          ROR     R3
005374  006003                          ROR     R3
005376  010304                  10$:    MOV     R3,R4                   ;LOAD R4
005400  042704  177770                  BIC     #177770,R4              ;MASK BITS
005404  062704  000060                  ADD     #60,R4                  ;MAKE A NUMBER
005410  000207                          RTS     PC

005412  012537  005552          MESG:   MOV     (5)+,COUNT
005416  012537  005554                  MOV     (5)+,FILE
005422  013777  005554  173424          MOV     FILE,@DPC               ;START DISPLAY
005430  005077  173354          MESGA:  CLR     @PSW
005434  000001                          WAIT
005436  005737  002046                  TST     KRBD
005442  001025                          BNE     MESGAB
005444  005337  005552          MESGAA: DEC     COUNT
005450  001405                          BEQ     MESGB
005452  012777  000001  173374          MOV     #1,@DPC                 ;SINGLE STEP THE DISPLAY
005460  000137  005430                  JMP     MESGA
005464  000240                  MESGB:  NOP
005466  005737  002046                  TST     KRBD
005472  001010                          BNE     MESGBA
005474  005037  005556                  CLR     SWITCH
005500  032737  000100  177570          BIT     #BIT6,@#DISPLAY
005506  001402                          BEQ     MESGBA
005510  005137  005556                  COM     SWITCH
005514  000205                  MESGBA: RTS     5
005516  005737  005556          MESGAB: TST     SWITCH
005522  001350                          BNE     MESGAA
005524  005737  001050                  TST     CHANGE
005530  001745                          BEQ     MESGAA
005532  005037  001050                  CLR     CHANGE
005536  005037  005556                  CLR     SWITCH
005542  005037  001042                  CLR     HOLD
005546  000137  001162                  JMP     SCOPEC
005552  000000                  COUNT:  0
005554  000000                  FILE:   0
005556  000000                  SWITCH: 0
```

```
1216
1217  005560  114000                  FRMED:  POINT
1218  005562  000000                          0
1219  005564  001500                          MAXY-277
1220  005566  170052                          STATSA!ITALO!SYNOFF!GREEN
1221  005570  103124                          CHAR!INT4!LPOFF!BLKOFF!LINEO
1222  005572     017     017                  .BYTE   17,17
1223  005574  052107  032055  020060          .ASCIZ  /GT-40 OR GT-44 WITH VR17 VISUAL TEST  (MD-11-DOGTG-A)/
1224  005602  051117  043440  026524
1225  005610  000064  053440  022111
1226  005616  020110  051126  033461
1227  005624  053040  051511  040525
1228  005632  020114  042524  052123
1229  005640  000040  046474  043504
1230  005646  000461  042055  043504
1231  005654  043524  040455  000076
1232  005662     015     012     012          .BYTE   15,12,12
1233  005665     040  020040  044504          .ASCII  /  DIRECTORY/
1234  005672  042522  052103  051117
1235  005700     131
1236  005701     015     012     012          .BYTE   15,12,12
1237  005704  030060  036440  040440          .ASCII  /00 = A = DIRECTORY/
1238  005712  036440  042040  051111
1239  005720  041505  047524  054522
1240  005726     015     012                  .BYTE   15,12
1241  005730  030460  036440  041040          .ASCII  /01 = B = DOT REPEATIBILITY/
1242  005736  036440  042040  052117
1243  005744  051040  050105  040505
1244  005752  044524  044502  044514
1245  005760  054524
1246  005762     015     012                  .BYTE   15,12
1247  005764  031060  036440  041440          .ASCII  /02 = C = PINCUSHION AND VECTOR CURVATURE (X OR Y OFFSET ADJ.)/
1248  005772  036440  050040  047111
1249  005776  052503  044123  047511
1250  006006  020116  047101  020104
1251  006014  042526  052103  051117
1252  006022  041440  051125  040526
1253  006030  052524  042522  036040
1254  006036  020130  051117  054440
1255  006044  047440  043106  042523
1256  006052  020124  042101  027112
1257  006060     076
1258  006061     015     012                  .BYTE   15,12
1259  006063     060  020063  020075          .ASCII  /03 = D = OCTAGONS OR SQUARES/
1260  006070  020104  020075  041517
1261  006076  042524  047507  051516
1262  006104  047440  020122  050523
1263  006112  040525  042522     123
1264  006117     015     012                  .BYTE   15,12
1265  006121     060  020064  020075          .ASCII  /04 = E = CHARACTER SET (CHAR. ADJ.)/
1266  006126  020105  020075  044103
1267  006134  051101  041501  042524
1268  006142  020122  042523  020124
1269  006150  042474  040510  027122
1270  006156  000440  045104  037056
1271  006164     015     012                  .BYTE   15,12
```

```
006166  032460  036440  043040          .ASCII  /05 = F = DASH LINES AND BLINK/
006174  036440  042040  051501
006202  020110  044514  046516
006210  020123  047101  020104
006216  046102  047111     113
006223     015     012                  .BYTE   15,12
006225     060  020056  020075          .ASCII  /06 = G = HORIZONTAL VECTOR ANGLE (ADJ. X VECTOR LENGTH)/
006232  020107  020075  047510
006240  044522  047532  052116
006246  046101  053040  041505
006254  047524  020122  047101
006262  046107  020105  040474
006270  045104  020056  020130
006276  042526  052103  051117
006304  046040  047105  052107
006312  037110
006314     015     012                  .BYTE   15,12
006316  033460  036440  044040          .ASCII  /07 = H = VERTICAL VECTOR ANGLE (ADJ. Y VECTOR LENGTH)/
006324  036440  053040  051105
006332  044524  040503  020114
006340  [illegible]  [illegible]  051117
006346  [illegible]  043516  042514
006354  036040  042101  027112
006362  054440  053040  041505
006370  047524  020122  042514
006376  043516  044124     076
006403     015     012                  .BYTE   15,12
006405     061  020060  020075          .ASCII  /10 = I = HORIZONTAL PHOSPHOR TEST/
006412  020111  020075  047510
006420  044522  047532  052116
006426  046101  053040  047510
006434  052123  [illegible]  020122
006442  042524  052123
006446     015     012                  .BYTE   15,12
006450  030461  036440  045040          .ASCII  /11 = J = VERTICAL PHOSPHOR TEST/
006456  [illegible]  053040  051105
006464  044524  040503  020114
006472  044120  051517  044120
006500  051117  052040  051505
006506     124
006507     015     012                  .BYTE   15,12
006511     061  020062  020075          .ASCII  /12 = K = INTENSITY LEVEL AND LIGHT-PEN TEST/
006516  020113  020075  047111
006524  042524  051516  052111
006532  020131  042514  042526
006540  020114  047101  020104
006546  044514  044107  026524
006554  042520  020116  042524
006562  052123
006564     015     012                  .BYTE   15,12
006566  031461  036440  046040          .ASCII  /13 = L = EDGE FLAG TEST/
006574  036440  042440  043504
006602  020105  046106  043501
006610  052040  051505     124
006615     015     012                  .BYTE   15,12
006617     061  020064  020075          .ASCII  /14 = M = SHORT VECTORS AND RELATIVE POINT/
```

```
006624  020115  020075  044123
006632  [illegible]  [illegible]  042526
006640  [illegible]  051117  020123
006646  047101  [illegible]  [illegible]
[illegible]
[illegible]
006670     015     012                    .BYTE   15,12
006672  032461  036440  047040            .ASCII  /15 = N = GRAPHPLOT TEST/
006700  [illegible]  [illegible]  040522
006706  [illegible]  [illegible]  052117
006714  [illegible]  051505     124
006721     015     012                    .BYTE   15,12
006723     061  [illegible]  020075       .ASCII  /16 = O = LIGHT PEN FOLLOW/
006730  020117  [illegible]  044514
006736  [illegible]  [illegible]  042520
006744  [illegible]  047506  046114
006752  053517
006754     015     012                    .BYTE   15,12
006756  [illegible]  036440  050040       .ASCII  /17 = P = KEYBOARD ECHO TEST/
006764  [illegible]  [illegible]  [illegible]
006772  047502  051101  [illegible]
[illegible]  041535  047510  052040
007006  051505     124
007011     015     012     012            .BYTE   15,12,12
007014  [illegible]  [illegible]  047502   .ASCII  / RUBOUT TO REMAIN ON THE PATTERN/
007022  [illegible]  [illegible]  020117
[illegible]  [illegible]  [illegible]  047111
[illegible]  [illegible]  [illegible]  044124
[illegible]  020105  [illegible]  052124
007072  051105     116
007075     015     012                    .BYTE   15,12
007077     040  041440  020122            .ASCIZ  / CR TO SELECT SUB-PICTURE OR STOP MOTION /
007084  047524  051440  [illegible]
007072  041535  020124  [illegible]
007100  [illegible]  044520  [illegible]
007106  051125  020105  051117
007114  051440  047524  020120
007122  047515  044524  047117
007130  000040
                                        .EVEN
007132  173400                          DSTOP
007134  16[illegible]00                  DJMP
007136  005560                          FRME0

007140                          FRME1:
007140  170052                          STATSA!ITALO!SYNOFF!GREEN
007142  116124                          POINT!INTO!LPOFF!BLKOFF!LINE0
007144  041000                          INTX+1000
007146  001000                          MAXY+1/2
007150  040000                          INTX+0
007152  000000                          0
007154  041000                          INTX+1000
007156  001000                          MAXY+1/2
007160  041777                          INTX+1777
007162  000000                          0
007164  041000                          INTX+1000
```

```
007166  001000                    MAXY+1/2
007170  041777                    INTX+1777
007172  001777                    MAXY
007174  041000                    INTX+1000
007176  001000                    MAXY+1/2
007200  040000                    INTX
007202  001777                    MAXY
007204  164000                    DNOP
007206  164000                    DNOP
007210  164000                    DNOP
007212  164000                    DNOP
007214  164000                    DNOP
007216  164000                    DNOP
007220  164000                    DNOP
007222  173400                    DSTOP
007224  160000                    DJMP
007226  007140                    FRME1

                          ;FILE 2 <ANALOG TUNE-UP TEST >

007230  116524            FRME2:  POINT!INT2!LPOFF!BLKOFF!LINED
007232  000000                    0
007234  000000                    0
007236  170052                    STATSA!ITALD!SYNOFF!GREEN
007240  110000                    LONGV
007242  041777                    INTX!MAXX                     ; +X, +Y
007244  000000                    0
007246  040000                    INTY                          ; +X, +Y
007250  001777                    MAXY
007252  061777                    INTX!MINUSX!MAXX              ; -X, +Y
007254  000000                    0
007256  040000                    INTX                          ; +X, -Y
007260  021777                    MINUSY!MAXY
007262  041777                    INTX!MAXX                     ; +X, -Y
007264  020000                    MINUSY
007266  060000                    INTX!MINUSX                   ; -X, +Y
007270  001777                    MAXY
007272  061777                    INTX!MINUSX!MAXX              ; -X, -Y
007274  020000                    MINUSY
007276  060000                    INTX!MINUSX                   ; -X, -Y
007300  021777                    MINUSY!MAXY
007302  041777                    INTX!MAXX
007304  001777                    MAXY
007306  061777                    INTX!MINUSX!MAXX
007310  021777                    MINUSX!MAXY
007312  001777                    MAXX
007314  000000                    0
007316  061777                    INTX!MINUSX!MAXX
007320  001777                    MAXY
007322  041777                    INTX!MAXX
007324  021777                    MINUSX!MAXY
007326  173400                    DSTOP
007330  160000                    DJMP
007332  007230                    FRME2

                          ;OCTAGONS
```

```
1440
1441  007334  117124          FRME3:  POINT!INT4!LPOFF!BLKOFF!LINEO
1442  007336  000774                  774
1443  007340  000564                  564
1444  007342  170032                  STATSA!ITALO!SYNOFF!GREEN
1445  007344  110000                  LONGV                          ;OCTOGON BY LENGTH OF 7
1446  007346  040007                  INTX+7
1447  007350  000000                  0
1448  007352  040007                  INTX+7
1449  007354  000007                  7
1450  007356  040000                  INTX
1451  007360  000007                  7
1452  007362  040007                  INTX!MINUSX+7
1453  007364  000007                  7
1454  007366  040007                  INTX!MINUSX+7
1455  007370  000000                  0
1456  007372  040007                  INTX!MINUSX+7
1457  007374  020007                  MINUSX+7
1458  007376  040000                  INTX
1459  007400  020007                  MINUSX+7
1460  007402  040007                  INTX+7
1461  007404  020007                  MINUSX+7
1462  007406  114000                  POINT
1463  007410  000770                  770
1464  007412  000550                  550
1465  007414  110000                  LONGV                          ;OCTOGON BY LENGTH OF 17
1466  007416  040017                  INTX+17
1467  007420  000000                  0
1468  007422  040017                  INTX+17
1469  007424  000017                  17
1470  007426  040000                  INTX
1471  007430  000017                  17
1472  007432  060017                  INTX!MINUSX+17
1473  007434  000017                  17
1474  007436  060017                  INTX!MINUSX+17
1475  007440  000000                  0
1476  007442  060017                  INTX!MINUSX+17
1477  007444  020017                  MINUSX+17
1478  007446  040000                  INTX
1479  007450  020017                  MINUSX+17
1480  007452  040017                  INTX+17
1481  007454  020017                  MINUSX+17
1482  007456  114000                  POINT
1483  007460  000760                  760
1484  007462  000520                  520
1485  007464  110000                  LONGV                          ;OCTOGON BY LENGTH OF 37
1486  007466  040037                  INTX+37
1487  007470  000000                  0
1488  007472  040037                  INTX+37
1489  007474  000037                  37
1490  007476  040000                  INTX
1491  007500  000037                  37
1492  007502  060037                  INTX!MINUSX+37
1493  007504  000037                  37
1494  007506  060037                  INTX!MINUSX+37
1495  007510  000000                  0
```

```
007512  060037          INTX!MINUSX+37
007514  [illegible]     MINUSX+37
007516  [illegible]     INTX
007[illegible]0  020037  MINUSX+37
007[illegible]2  040037  INTX+37
007[illegible]4  020037  MINUSX+37
007[illegible]6  114000  POINT
007[illegible]0  000740  740
007532  000440          440
007534  110000          LONGV                    ;OCTOGON BY LENGTH OF 77
007536  040077          INTX+77
007540  000000          0
007542  040077          INTX+77
007544  000077          77
007546  040000          INTX
007[illegible]0  000077  77
007[illegible]2  0[illegible]077  INTX!MINUSX+77
007[illegible]4  0[illegible]077  77
007[illegible]6  060077  INTX!MINUSX+77
007[illegible]0  000000  0
007[illegible]2  0[illegible]077  INTX!MINUSX+77
007[illegible]4  0[illegible]077  MINUSX+77
007[illegible]6  04[illegible]000  INTX
007570  0[illegible]077  MINUSX+77
007572  040077          INTX+77
007574  020077          MINUSX+77
007576  114000          POINT
007600  000700          700
007602  000300          300
007604  110000          LONGV                    ;OCTOGON BY LENGTH OF 177
007606  040177          INTX+177
007610  000000          0
007612  040177          INTX+177
007614  000177          177
007616  040000          INTX
007620  000177          177
007622  060177          INTX!MINUSX+177
007624  000177          177
007626  0[illegible]0177  INTX!MINUSX+177
007630  0[illegible]0000  0
007632  0[illegible]0177  INTX!MIN[illegible]SX+177
007634  0[illegible]0177  MINUSX+177
007636  040000          INTX
007640  020177          MINUSX+177
007642  040177          INTX+177
007644  020177          MINUSX+177
007646  114000          POINT
007650  000[illegible]00  600
007652  000000          0
007654  110000          LONGV                    ;OCTOGON BY LENGTH OF 377
007656  040377          INTX+377
007660  000000          0
007662  0[illegible]0377  INTX+377
007664  0[illegible]0377  377
007666  0[illegible]0000  INTX
007670  000377          377
```

```
007672  060377                    INTX!MINUSX+377
007674  000377                    377
007676  060377                    INTX!MINUSX+377
007700  000000                    0
007702  060377                    INTX!MINUSX+377
007704  020377                    MINUSX+377
007706  040000                    INTX
007710  020377                    MINUSX+377
007712  040377                    INTX+377
007714  020377                    MINUSX+377
007716  173400                    DSTOP
007720  160000                    DJMP
007722  007334                    FRME3
                          ;SQUARES   7,17,37,77,177,377,777 WIDE

007724  117124            FRME3A: POINT!INT4!LPOFF!BLKOFF!LINEO          ; BY 7
007726  001000                    1000
007730  000600                    600
007732  170052                    STATSA!ITALO!SYNOFF!GREEN
        000007                    B=7
        000004                    R=4
007734  110000                    LONGV                          ;BY 7 AND 4
007736  040007                    INTX+7
007740  000000                    0
007742  040000                    INTX
007744  000007                    7
007746  060007                    INTX!MINUSX+7
007750  000000                    0
007752  040000                    INTX
007754  020007                    MINUSX+7
007756  020004                    MINUSX+4
007760  020004                    MINUSX+4
                                  .LIST
007762  110000                    LONGV                          ;BY 17 AND 7
007764  040017                    INTX+17
007766  000000                    0
007770  040000                    INTX
007772  000017                    17
007774  060017                    INTX!MINUSX+17
007776  000000                    0
010000  040000                    INTX
010002  020017                    MINUSX+17
010004  020007                    MINUSX+7
010006  020007                    MINUSX+7
                                  .LIST
010010  110000                    LONGV                          ;BY 37 AND 17
010012  040037                    INTX+37
010014  000000                    0
010016  040000                    INTX
010020  000037                    37
010022  060037                    INTX!MINUSX+37
010024  000000                    0
010026  040000                    INTX
010030  020037                    MINUSX+37
010032  020017                    MINUSX+17
010034  020017                    MINUSX+17
```

```
                                        .LIST
010036  110000                          LONGV                           ;BY 77 AND 37
010040  040077                          INTX+77
010042  000000                          0
010044  040000                          INTX
010046  000077                          77
010050  060077                          INTX!MINUSX+77
010052  000000                          0
010054  040000                          INTX
010056  020077                          MINUSX+77
010060  020037                          MINUSX+37
010062  020037                          MINUSX+37
                                        .LIST
010064  110000                          LONGV                           ;BY 177 AND 77
010066  040177                          INTX+177
010070  000000                          0
010072  040000                          INTX
010074  000177                          177
010076  060177                          INTX!MINUSX+177
010100  000000                          0
010102  040000                          INTX
010104  020177                          MINUSX+177
010106  020077                          MINUSX+77
010110  020077                          MINUSX+77
                                        .LIST
010112  110000                          LONGV                           ;BY 377 AND 177
010114  040377                          INTX+377
010116  000000                          0
010120  040000                          INTX
010122  000377                          377
010124  060377                          INTX!MINUSX+377
010126  000000                          0
010130  040000                          INTX
010132  020377                          MINUSX+377
010134  020177                          MINUSX+177
010136  020177                          MINUSX+177
                                        .LIST
010140  110000                          LONGV                           ;BY 777 AND 377
010142  040777                          INTX+777
010144  000000                          0
010146  040000                          INTX
010150  000777                          777
010152  060777                          INTX!MINUSX+777
010154  000000                          0
010156  040000                          INTX
010160  020777                          MINUSX+777
010162  020377                          MINUSX+377
010164  020377                          MINUSX+377
                                        .LIST
010166  173400                          DSTOP
010170  160000                          DJMP
010172  007724                          FRME3A

                                ;DASH LINE TEST

010174  117000                  FRME5:  POINT!INT4
```

```
010176  000000                          0
010200  001000                          1000
010202  174400                          STATSB!SIZEO
010204  170052                          STATSA!ITALO!SYNOFF!GREEN
010206  100004                          CHAR!LINEO
010210     017     017                  .BYTE   17,17
010212  047523  044514  020104          .ASCII /SOLID     /
010220  020040  020040
010224  110004                          LONGV!LINEO
010226  040400                          40400
010230  000000                          0
010232  000400                          400
010234  000000                          0
010236  110030                          LONGV!BLKON
010240  040400                          40400
010242  000000                          0
010244  100020                          CHAR!BLKOFF
010246     015     012     012          .BYTE   15,12,12,12,12,12
010251     012     012     012
010254  040504  044123  044440          .ASCII /DASH I    /
010262  020040  020040
010266  110005                          LONGV!LINE1
010270  040400                          40400
010272  000000                          0
010274  000400                          400
010276  000000                          0
010300  110030                          LONGV!BLKON
010302  040400                          40400
010304  000000                          0
010306  100020                          CHAR!BLKOFF
010310     015     012     012          .BYTE   15,12,12,12,12,12
010313     012     012     012
010316  040504  044123  044440          .ASCII /DASH II   /
010324  020111  020040
010330  110006                          LONGV!LINE2
010332  040400                          40400
010334  000000                          0
010336  000400                          400
010340  000000                          0
010342  110030                          LONGV!BLKON
010344  040400                          40400
010346  000000                          0
010350  100020                          CHAR!BLKOFF
010352     015     012     012          .BYTE   15,12,12,12,12,12
010355     012     012     012
010360  040504  044123  044440          .ASCII /DASH III  /
010366  044511  020040
010372  110007                          LONGV!LINE3
010374  040400                          40400
010376  000000                          0
010400  000400                          400
010402  000000                          0
010404  110030                          LONGV!BLKON
010406  040400                          40400
010410  000000                          0
010412  110024                          LONGV!BLKOFF!LINEO
```

```
010414  000000                          0
010416  000000                          0
010420  173400                          DSTOP
010422  160000                          DJMP
010424  010174                          FRME5

                                ;VECTOR LENGTH TEST (FILE 6 AND 7)

010426  114000                  FRME6:  POINT
010430  001777                          MAXX
010432  000000                          0
010434  170052                          STATSA!ITALO!SYNOFF!GREEN
010436  113724                          LONGV!INT7!LPOFF!BLKOFF!LINEO
010440  040000                          INTX
010442  001777                          MAXY
010444  114000                          POINT
010446  000000                          0
010450  001777                          MAXY
010452  110000                          LONGV
010454  041777                          INTX!MAXX
010456  000000                          0
010460  173400                          DSTOP
010462  114000                  FRME6A: POINT
010464  000000                          0
010466  000000                          0
010470  110000                          LONGV
010472  000000                  DELTX6: 0
010474  000000                  DELTY6: 0
010476  173400                          DSTOP
010500  160000                          DJMP
010502  010462                          FRME6A


                                ;PHOSPHOR TEST

010504  114000                  FRME10: POINT
010506  000000                  DELTX7: 0
010510  000000                          0
010512  170052                          STATSA!ITALO!SYNOFF!GREEN
010514  113724                  DFI10A: LONGV!INT7!LPOFF!BLKOFF!LINEO
010516  040000                          INTX
010520  001777                          MAXY
010522  000002                          2
010524  000000                          0
010526  040000                          INTX
010530  021777                          MINUSY!MAXY
010532  000002                          2
010534  000000                          0
010536  173400                          DSTOP
010540  160000                          DJMP
010542  010514                          DFI10A

                                ;PHOSPHOR TEST

010544  114000                  FRME11: POINT
010546  000000                          0
```

```
010550  000000                    DELTY7: 0
010552  170052                            STATSA!ITALO!SYNOFF!GREEN
010554  113724                    DFI11C: LONGV!INT7!LPOFF!BLKOFF!LINEO
010556  041777                            INTX!MAXX
010560  000000                            0
010562  000000                            0
010564  000002                            2
010566  061777                            INTX!MINUSX!MAXX
010570  000000                            0
010572  000000                            0
010574  000002                            2
010576  173400                            DSTOP
010600  160000                            DJMP
010602  010554                            DFI11C

010604  117604                    FRM10:  POINT!INT7!LINEO
010606  000000                            0
010610  000000                            0
010612  110000                            LONGV
010614  041777                            INTX!MAXX
010616  000000                            0
010620  040000                            INTX
010622  001777                            MAXY
010624  061777                            INTX!MINUSX!MAXX
010626  000000                            0
010630  040000                            INTX
010632  021777                            MINUSX!MAXY
010634  173400                            DSTOP
010636  160000                            DJMP
010640  010604                            FRM10

                                  ;INTENSITY TEST

010642  114164                    FRME12: POINT!LINEO!LPON!BLKOFF
010644  000000                            0
010646  001200                            1200
010650  170252                    SYN12:  STATSA!LPLITE!SYNOFF!ITALO!GREEN
010652  103600                            CHAR!INT7
010654     017     017                    .BYTE   17,17
010656  047111  042524  051516            .ASCII /INTENSITY 7   /
010664  052111  020131  020067
010672  020040
010674  110000                            LONGV
010676  041000                            41000
010700  000000                            0
010702  130000                            RELATV
010704  057600                            57600
010706  103400                            CHAR!INT6
010710     015     012     012            .BYTE 15,12,12,12
010713     012
010714  047111  042524  051516            .ASCII /INTENSITY 6   /
010722  052111  020131  020066
010730  020040
010732  110000                            LONGV
010734  041000                            41000
010736  000000                            0
```

```
010740  130000                          RELATV
010742  057600                          57600
010744  103200                          CHAR!INT5
010746     015     012     012          .BYTE 15,12,12,12
010751     012
010752  047111  042524  051516          .ASCII /INTENSITY 5   /
010760  052111  020131  020065
010766  020040
010770  110000                          LONGV
010772  041000                          41000
010774  000000                          0
010776  130000                          RELATV
011000  057600                          57600
011002  103000                          CHAR!INT4
011004     015     012     012          .BYTE 15,12,12,12
011007     012
011010  047111  042524  051516          .ASCII /INTENSITY 4   /
011016  052111  020131  020064
011024  020040
011026  110000                          LONGV
011030  041000                          41000
011032  000000                          0
011034  130000                          RELATV
011036  057600                          57600
011040  102600                          CHAR!INT3
011042     015     012     012          .BYTE 15,12,12,12
011045     012
011046  047111  042524  051516          .ASCII /INTENSITY 3   /
011054  052111  020131  020063
011062  020040
011064  110000                          LONGV
011066  041000                          41000
011070  000000                          0
011072  130000                          RELATV
011074  057600                          57600
011076  102400                          CHAR!INT2
011100     015     012     012          .BYTE 15,12,12,12
011103     012
011104  047111  042524  051516          .ASCII /INTENSITY 2   /
011112  052111  020131  020062
011120  020040
011122  110000                          LONGV
011124  041000                          41000
011126  000000                          0
011130  130000                          RELATV
011132  057600                          57600
011134  102200                          CHAR!INT1
011136     015     012     012          .BYTE 15,12,12,12
011141     012
011142  047111  042524  051516          .ASCII /INTENSITY 1   /
011150  052111  020131  020061
011156  020040
011160  110000                          LONGV
011162  041000                          41000
011164  000000                          0
011166  130000                          RELATV
```

```
011170  057600                                  57600
011172  102000                                  CHAR!INTO
011174     015     012     012                  .BYTE 15,12,12,12
011177     012
011200  047111  042524  051516                  .ASCII /INTENSITY 0   /
011206  052111  020131  020060
011214  020040
011216  110000                                  LONGV
011220  041000                                  41000
011222  000000                                  0
011224  130000                                  RELATV
011226  057600                                  57600
011230  164 00                                  DNOP
011232  164 00                                  DNOP
011234  164 00                                  DNOP
011236  164 00                                  DNOP
011240  164 00                                  DNOP
011242  164 00                                  DNOP
011244  164000                                  DNOP
011246  164000                                  DNOP
011250  173400                          RAYLPA: DSTOP
011252  164000                                  DNOP
011254  164000                                  DNOP

011256  117100                          DFI12A: POINT!INT4!LPOFF
011260  001500                                  1500
011262  001200                          LPPNT:  1200
011264  100000                                  CHAR
011266  044514  044107  020124                  .ASCIZ  /LIGHT PEN HIT/
011274  042520  020116  044510
011302  000124

                                                .EVEN
011304  173400                                  DSTOP
011306  160000                                  DJMP
011310  010642                                  FRME12

                                        ;EDGE FILE

011312  117124                          FRME13: POINT!INT4!LPOFF!BLKOFF!LINEO
011314  000000                                  0
011316  000000                                  0
011320  170052                                  STATSA!ITALO!SYNOFF!GREEN
011322  100000                                  CHAR
011324     017     017                          .BYTE   17,17
011326  110000                                  LONGV
011330  041777                                  INTX!MAXX
011332  000000                                  0
011334  040000                                  INTX
011336  001777                                  MAXY
011340  061777                                  INTX!MINUSX!MAXX
011342  000000                                  0
011344  040000                                  INTX
011346  021777                                  MINUSY!MAXY
011350  114000                                  POINT
011352  000100                                  100
011354  000300                                  300                             ;LEFT SIDE
```

```
011356  110000                          LONGV
011360  040000                          INTX
011362  000400                          400
011364  060200                          INTX!MINUSX+200
011366  000000                          0
011370  040000                          INTX
011372  020400                          MINUSY+400
011374  040200                          INTX+200
011376  000000                          0
011400  114000                          POINT
011402  000200                          200                     ;TOP SIDE
011404  001700                          MAXY+1-100
011406  110000                          LONGV
011410  040400                          INTX+400
011412  000000                          0
011414  040000                          INTX
011416  000200                          200
011420  060400                          INTX!MINUSX+400
011422  000000                          0
011424  040000                          INTX
011426  020200                          MINUSY+200
011430  114000                          POINT                   ;RIGHT SIDE
011432  001700                          1700
011434  001500                          MAXY+1-300
011436  110000                          LONGV
011440  040000                          INTX
011442  020400                          MINUSY+400
011444  040200                          INTX+200
011446  000000                          0
011450  040000                          INTX
011452  000400                          400
011454  060200                          INTX!MINUSX+200
011456  000000                          0
011460  114000                          POINT
011462  001600                          1600                    ;BOTTOM SIDE
011464  000100                          100
011466  110000                          LONGV
011470  060400                          INTX!MINUSX+400
011472  000000                          0
011474  040000                          INTX
011476  020200                          MINUSY+200
011500  040400                          INTX+400
011502  000000                          0
011504  040000                          INTX
011506  000200                          200
011510  114000                          POINT
011512  001777                          MAXX
011514  000400                          400
011516  110000                          LONGV
011520  000020                          20
011522  000000                          0
011524  100000                          CHAR
011526     015      101                 .BYTE   15,101          ;"CR" AND AN "A"
011530  114000                          POINT
011532  000000                          0
011534  000500                          500
```

```
2000  011536  110000                          LONGV
2001  011540  020012                          MINUSX+12
2002  011542  000000                          0
2003  011544  100000                          CHAR
2004  011546     040      102                 .BYTE   40,102          ;"SPACE" AND AN "B"
2005  011550  164000                          DNOP
2006  011552  164000                          DNOP
2007  011554  173400                          DSTOP
2008  011556  164000                          DNOP
2009  011560  164000                          DNOP
2010  011562  160000                          DJMP
2011  011564  011312                          FRME13
2012
```

```
011566  170052          FRME14: STATSA!ITALO!SYNOFF!GREEN
011570  117124                  POINT!INT4!BLKOFF!LPOFF!LINEO
011572  000000          FRM14A: 0
011574  000000          FRM14B: 0
011576  104000                  SHORTV
011600  076200                  INTX+16200
011602  076271                  INTX+16200+71
011604  040071                  INTX+71
011606  076271                  INTX!MINUSX+16200+71
011610  076200                  INTX!MINUSX+16200
011612  076371                  INTX!MINUSX+16200+MINSUY+71
011614  040171                  INTX+MINSUY+71
011616  076371                  INTX+16200+MINSUY+71
011620  020504                  20504
011622  164000                  DNOP
011624  164000                  DNOP
011626  130000                  RELATV
011630  057000                  INTX+17000
011632  057074                  INTX+17000+74
011634  040074                  INTX+74
011636  077074                  INTX!MINUSX+17000+74
011640  077000                  INTX!MINUSX+17000
011642  077174                  INTX!MINUSX+17000+MINSUY+74
011644  040174                  INTX+MINSUY+74
011646  057174                  INTX+17000+MINSUY+74
011650  020504                  20504
011652  164000                  DNOP
011654  164000                  DNOP
011656  104000                  SHORTV
011660  057600                  INTX+17600
011662  057677                  INTX+17600+77
011664  040077                  INTX+77
011666  077677                  INTX!MINUSX+17600+77
011670  077600                  INTX!MINUSX+17600
011672  077777                  INTX!MINUSX+17600+MINSUY+77
011674  040177                  INTX+MINSUY+77
011676  057777                  INTX+17600+MINSUY+77
011700  020504                  20504
011702  164000                  DNOP
011704  164000                  DNOP
011706  173400                  DSTOP
011710  160000                  DJMP
011712  011566                  FRME14
```

```
011714  117724                  FRME16: POINT!INT7!LPOFF!BLKOFF!LINEO
011716  000000                          0
011720  001600                          MAXY-177
011722  170[illegible]2                  STATSA!ITALO!SYNOFF!GREEN
011724  100000                          CHAR
011726     017     017                  .BYTE   17,17
011730  044514  044107  020124          .ASCII  /LIGHT PEN FOLLOW TEST /
011736  042520  020116  047506
011744  046114  053517  052040
011752  051505  020124
011756     015     012     012          .BYTE   15,12,12
011761     130  020075                  .ASCII  /X= /
011764  030061  030060          DLT14A: .ASCII  /1000/
011770     015     012     012          .BYTE   15,12,12
011773     131  020075                  .ASCII  /Y= /
011776  033060  030060          DLT14B: .ASCII  /0600/
012002  114140                          POINT!LPON
012004  001000                  RAY14A: 1000
012006  000600                  RAY14B: 600
012010  164000                          DNOP
012012  164000                          DNOP
012014  1[illegible]0                   RELATV
012016  074000                  TAB16A: INTX!MINUSX+14000
012020  041000                          INTX+1000
012022  041000                          INTX+1000
012024  041000                          INTX+1000
012026  041000                          INTX+1000
012030  041000                          INTX+1000
012032  041000                          INTX+1000
012034  041000                          INTX+1000
012036  041000                          INTX+1000
012040  041000                          INTX+1000
012042  041000                          INTX+1000
012044  041000                          INTX+1000
012046  041000                          INTX+1000
012050  041000                          INTX+1000
012052  041000                          INTX+1000
012054  041000                          INTX+1000
012056  041000                          INTX+1000
012060  041000                          INTX+1000
012062  041000                          INTX+1000
012064  041000                          INTX+1000
012066  041000                          INTX+1000
012070  041000                          INTX+1000
012072  041000                          INTX+1000
012074  041000                          INTX+1000
012076  041000                          INTX+1000
012100  164000                          DNOP
012102  164000                          DNOP
012104  164000                          DNOP
012106  164000                          DNOP
012110  164000                          DNOP
012112  164000                          DNOP
012114  164000                          DNOP
012116  164000                          DNOP
```

```
2114  012120  164000                          DNOP
2115  012122  164000                          DNOP
2116  012124  130000                          RELATV
2117  012126  034000                          MINUSX+14000
2118  012130  040160            TAB16B:       INTX!MINSUY+60
2119  012132  040004                          INTX+4
2120  012134  040004                          INTX+4
2121  012136  040004                          INTX+4
2122  012140  040004                          INTX+4
2123  012142  040004                          INTX+4
2124  012144  040004                          INTX+4
2125  012146  040004                          INTX+4
2126  012150  040004                          INTX+4
2127  012152  040004                          INTX+4
2128  012154  040004                          INTX+4
2129  012156  040004                          INTX+4
2130  012160  040004                          INTX+4
2131  012162  040004                          INTX+4
2132  012164  040004                          INTX+4
2133  012166  040004                          INTX+4
2134  012170  040004                          INTX+4
2135  012172  040004                          INTX+4
2136  012174  040004                          INTX+4
2137  012176  040004                          INTX+4
2138  012200  040004                          INTX+4
2139  012202  040004                          INTX+4
2140  012204  040004                          INTX+4
2141  012206  040004                          INTX+4
2142  012210  040004                          INTX+4
2143  012212  164000                          DNOP
2144  012214  164000                          DNOP
2145  012216  164000                          DNOP
2146  012220  164000                          DNOP
2147  012222  164000                          DNOP
2148  012224  164000                          DNOP
2149  012226  164000                          DNOP
2150  012230  164000                          DNOP
2151  012232  110000                          LONGV
2152  012234  000000                          0
2153  012236  000077                          77
2154  012240  040160            PNT16A:       INTX+160
2155  012242  020160                          MINUSX+160
2156  012244  060160            PNT16B:       INTX!MINUSX+160
2157  012246  020160                          MINUSX+160
2158  012250  060160            PNT16C:       INTX!MINUSX+160
2159  012252  000160                          160
2160  012254  040160            PNT16D:       INTX+160
2161  012256  000160                          160
2162  012260  164000                          DNOP
2163  012262  164000                          DNOP
2164  012264  164000                          DNOP
2165  012266  164000                          DNOP
2166  012270  164000                          DNOP
2167  012272  164000                          DNOP
2168  012274  173400                          DSTOP
2169  012276  160000                          DJMP
```

```
012300  011714                          FRME16

012302  117724                  FRM16A: POINT!INT7!LPOFF!BLKOFF!LINE0
012304  000000                          0
012306  001600                          MAXY-177
012310  170052                          STATSA!ITALO!SYNOFF!GREEN
012312  100000                          CHAR
012314     017     017                  .BYTE   17,17
012316  044514  044107  020124          .ASCII  /LIGHT PEN FIELD OF VIEW /
012324  042520  020116  044506
012332  046105  020104  043117
012340  053040  042511  020127
012346     015     012     012          .BYTE   15,12,12
012351     116  046525  042502          .ASCII  /NUMBER OF HITS = 0000/
012356  020122  043117  044000
012364  020111  020123  020075
012372  000000  030060
012376  173000                  FRM16B: DSTOP
012400  160000                          DJMP
012402  012302                          FRM16A

012404  114124                  FRME17: POINT!LPOFF!BLKOFF!LINE0                ;MUST BE JUST BEFORE THE BUFFER
012406  000000                          0
012410  001600                          MAXY-177
012412  170052                          STATSA!ITALO!SYNOFF!GREEN
012414  103000                          CHAR!INT4
012416     017     017                  .BYTE   17,17
012420  042513  041131  040517          .ASCIZ  /KEYBOARD ECHO TEST/
012426  042122  042440  044103
012434  020117  042524  052123
012442     000
012443     015     012     012          .BYTE   15,12,12
012446  044103  051101  047440          .ASCII  /CHAR OCT = /
012454  052103  036440     040
012461     000     000     000          .BYTE   0,0,0,0
012464     000
012465     015     012     012  KBOCT:  .BYTE   15,12,12

012470  164000                  BUFFER: DNOP

        000001                          .END
```

BIT6 =	000100	592#	1201											
BLKOFF=	000020	592#	1237	1221	1374	1404	1441	1567	1680	1693	1706	1719	1732	1759
		1778	1809	1956	2016	2059	2172	2191						
BLKON =	000030	592#	1677	1690	1703	1716								
BUFFER	012470	401	402	403	404	405	406	610	637	651	684	706	755*	758
		760*	763	904	914	947	957	973	981	1009	1017	1036	1111*	1118
		1120	1132	2208#										
CHANGE	001050	414#	572*	1207	1209*									
CHAR =	100000	592#	690	1221	1668	1680	1693	1706	1813	1823	1834	1845	1856	1867
		1878	1889	1915	1930	1995	2003	2063	2176	2195				
CHRCNT	005330	1131*	1148*	1165#										
CNTR	001046	413#	646*	657*	663*	669*	676*	784*	796*	811*	823*	917*	920*	1054*
		1059*												
COUNT	005552	1186*	1193*	1213#										
CRLF	002670	728	733#											
DBUF	001016	401#												
DBUF1	001020	402#												
DBUF2	001022	403#												
DBUF3	001024	404#												
DBUF4	001026	405#	982*	983	985*									
DBUF5	001030	406#	975*	978*										
DDONE	001064	426#	516	520	546*									
DDONE1	001066	427#	547*											
DELTX6	010472	781*	813*	820*	1746#									
DELTX7	010506	835*	845*	846	1756#									
DELTY6	010474	786*	793*	809*	1747#									
DELTY7	010550	852*	862*	863	1776#									
DFI10A	010514	1759#	1770											
DFI11C	010554	1778#	1789											
DFI12A	011256	1912#												
DFL15B	004242	977	979#	984										
DFL15C	004144	964#												
DFL15D	004220	975#	987											
DISPLA=	177570	375#	440	443	451	540	1201							
DISPTC	001210	459	460#											
DJMP =	160000	592#	636	705	913	972	1016	1369	1399	1436	1563	1658	1723	1749
		1769	1783	1804	1921	2010	2056	2169	2188					
DLT14A	011764	530*	531*	1076	2071#									
DLT14B	011776	533*	533*	1079	2074#									
DNOP =	164000	592#	8[illegible]	1391	1392	1393	1394	1395	1396	1397	1900	1901	1902	1903
		1904	1905	1906	1907	1909	1910	2005	2006	2008	2009	2029	2030	2041
		2042	2[illegible]3	2054	2078	2079	2106	2107	2108	2109	2110	2111	2112	2113
		2114	2115	2143	2144	2145	2146	2147	2148	2149	2150	2162	2163	2164
		2165	2166	2167	2208									
DPC	001054	421#	510	514	689*	1084*	1188*	1195*						
DSAVE	001032	407#	785*	794*	812*	821*	872*	881*	965*	967*	968	974*	986*	1010*
		1039*	1123*	1154	1158*	1161*								
DSAVE1	001034	408#	783*	786	801*	808*	813	828*	1008*	1042*				
DSAVE2	001036	409#	782*	802*	810*	829*								
DSAVE3	001040	410#												
DSR	001056	422#	554											
DSTOP =	173400	592#	635	704	883	912	971	1015	1119	1368	1398	1435	1562	1657
		1722	1741	1748	1768	1787	1803	1908	1920	2007	2055	2168	2187	
D7A	003330	836#	844	847										
D7C	003360	845#												
D7D	003404	853#	861	864										

D7F	003434	862#					
ECHOA	005060	1119#	1121				
ECHOB	005316	1155	1160#				
ECHOC	005166	1133#	1138	1159	1162		
FILE	005554	1187*	1193	1214#			
FILE0	002050	460	534	595#	998		
FILE1	00[illegible]62	461	602#				
FILE10	003322	468	834#				
FILE11	003376	469	851#				
FILE12	003452	470	869#				
FILE13	003614	471	896#				
FILE14	003626	472	903#				
FILE15	004106	473	950	956#			
FILE16	004342	474	1005#	1044			
FILE17	00[illegible]52	475	111[illegible]#	1150			
FILE2	00[illegible]74	462	609#				
FILE2A	0[illegible]274	638	646#				
FILE2B	0[illegible]302	647#	658				
FILE2C	0[illegible]2	648	654#				
FILE2D	0[illegible]2	652	657#				
FILE3	0[illegible]0	463	662#				
FILE3A	0[illegible]0	664#	670	677			
FILE3B	0[illegible]76	665	673#				
FILE4	0[illegible]414	464	671	683#			
FILE4A	0[illegible]2746	707	754#				
FILE5	003024	465	767	773#			
FILE6	003036	466	780#				
FILE7	003170	467	807#				
FILLA	002716	740#	743				
FILLIT	0[illegible]2712	723	727	739#			
FIL14A	003734	915	924#				
FLE12A	003476	873#	884				
FLE12B	003514	874	877#				
FLE12C	003522	876	878#				
FLE12D	003606	882	891#				
FR[illegible]0	0[illegible]560	598	1217#	1370			
FRME1	007140	605	1372#	1400			
FRME10	010504	838	1755#				
FRME11	010544	855	1774#				
FR[illegible]E12	010642	880	1809#	1922			
FR[illegible]E13	011312	899	1926#	2011			
FRME14	011566	929	934	939	944	2015#	2057
FR[illegible]E16	011714	1027	2059#	2170			
FR[illegible]E17	012404	1135	2191#				
FRME2	007230	656	1404#	1437			
FRME3	007[illegible]4	668	1441#	1564			
FRME3A	007[illegible]4	675	1567#	1659			
FR[illegible]5	010174	776	1663#	1724			
FR[illegible]6	010426	789	816	1728#			
FRME6A	010462	792	819	1742#	1750		
FRM10	010604	841	858	1791#	1805		
FRM14A	011572	925*	930*	935*	940*	2017#	
FRM14B	011574	926*	931*	936*	941*	2018#	
FRM16A	012302	1032	2172#	2189			
FRM16B	012376	1019*	1020*	1072	2187#		
GRAPHX=	120000	592#	963				

GRAPHY=	124000	592#												
GREEN =	000002	5[illegible]#	686	961	1220	1373	1407	1444	1570	1667	1731	1758	1777	1812
		1[illegible]3	2015	2062	2175	2194								
GSADD	001000	3[illegible]3#	511											
GSGRL	001004	395#	871	1007										
GSVCT	001002	394#	517											
HERE	004330	990	9[illegible]3#											
HIGPWR	001302	486	491#											
HITCNT	005050	1018*	1070*	1071	1114#									
HOLD	001042	411#	445	523*	527*	574*	578*	580*	1211*					
I[illegible]NT	001006	397#												
I[illegible]CR =	000100	592#	962	985										
INTX =	040000	592#	613	621	625	633	781	808	918	1049	1111	1375	1377	1379
		1391	1383	1385	1387	1389	1409	1411	1413	1415	1417	1419	1421	1423
		1425	1427	1431	1433	1446	1448	1450	1452	1454	1456	1458	1460	1466
		1468	1470	1472	1474	1476	1478	1480	1486	1488	1490	1492	1494	1496
		1498	1500	1506	1508	1510	1512	1514	1516	1518	1520	1526	1528	1530
		1532	1534	1536	1538	1540	1546	1548	1550	1552	1554	1556	1558	1560
		1574	1576	1578	1580	1586	1588	1590	1592	1598	1600	1602	1604	1610
		1612	1614	1616	1622	1624	1626	1628	1634	1636	1638	1640	1646	1648
		1650	1652	1733	1739	1760	1764	1779	1783	1795	1797	1799	1801	1933
		1935	1937	1939	1945	1947	1949	1951	1957	1959	1961	1963	1969	1971
		1973	1975	1981	1983	1985	1987	2020	2021	2022	2023	2024	2025	2026
		2027	2032	2033	2034	2035	2036	2037	2038	2039	2044	2045	2046	2047
		2048	2049	2050	2051	2081	2082	2083	2084	2085	2086	2087	2088	2089
		2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102
		2103	2104	2105	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127
		2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140
		2141	2142	2154	2156	2158	2160							
INT0 =	002000	592#	1374	1889										
INT1 =	002200	592#	1878											
INT2 =	002400	592#	1404	1867										
INT3 =	002600	592#	1856											
INT4 =	003000	592#	640	687	908	1221	1441	1567	1663	1845	1912	1926	2016	2195
INT5 =	003200	592#	1834											
INT6 =	003400	592#	1823											
INT7 =	003600	592#	958	1011	1732	1759	1778	1791	1813	2059	2172			
ITALO =	000040	592#	686	699	721	961	1220	1373	1407	1444	1570	1667	1731	1758
		1777	1812	1929	2015	2062	2175	2194						
ITAL1 =	000060	592#	702	725										
KBCHR	005332	1073	1077	1080	1153	1168#								
KBOCT	012465	1124*	1125*	1126*	1127*	1151	2206#							
KRBD	002046	437	539*	542*	590#	1191	1198							
KYT1	002014	568	580#											
KYT2	001774	570	576#											
KYT3	002024	565	584#											
KYT4	002036	577	588#											
KYT5	001736	568#	589											
LADVT	003714	918#	921											
LINE0 =	000004	592#	687	908	1011	1221	1374	1404	1441	1567	1668	1672	1719	1732
		1759	1778	1791	1809	1926	2016	2059	2172	2191				
LINE1 =	000005	592#	1685											
LINE2 =	000006	592#	1698											
LINE3 =	000007	592#	1711											
LOADAC	004534	1047#	1055											
LOADBF	002624	694	696	698	721#									

LOADSP	002564	700	703	709#										
LOADUP	004556	1014	1054#											
LOADVT	003705	909	911	917#										
LOGICA	004316	993#												
LOKRB	001052	415#	1122*	1136	1141*	1144*								
LONGV =	110000	592#	643	1056	1408	1445	1465	1485	1505	1525	1545	1573	1585	1597
		1609	1621	1633	1645	1672	1677	1685	1690	1698	1703	1711	1716	1719
		1732	1738	1745	1759	1778	1794	1818	1829	1840	1851	1862	1873	1884
		1895	1932	1944	1956	1968	1980	1992	2000	2151				
LOOPA	003062	784#	800	803										
LOOPA1	003070	785#	797											
LOOPA2	003114	790#	795											
LOOPA3	003140	796#												
LOOPB	003214	811#	827	830										
LOOPB1	003222	812#	824											
LOOPB2	003246	817#	822											
LOOPB3	003272	823#												
LOWPWR	001250	381	479#	498										
LOWSV	001300	485*	489#	491										
LPDARK=	000300	592#												
LPLITE=	000200	592#	1812											
LPOFF =	000100	592#	687	1221	1374	1404	1441	1567	1732	1759	1778	1912	1926	2016
		2059	2172	2191										
LPON =	000140	592#	1011	1809	2075									
LPPNT	011262	886*	887*	1914#										
LPVCT	001070	429#	548*	870*	891*	1006*								
LPVCT1	001072	430#	548	549*	871*	891	1007*							
MAXSX =	017600	592#												
MAXSY =	000077	592#												
MAXX =	001777	592#	625	627	633	781	1409	1413	1417	1421	1425	1427	1429	1431
		1433	1729	1739	1779	1783	1795	1799	1933	1937	1990			
MAXY =	001777	592#	614	616	622	624	689	755	785	809	863	907	936	941
		1219	1376	1380	1384	1386	1388	1390	1412	1416	1420	1424	1426	1428
		1432	1434	1734	1737	1761	1765	1798	1802	1936	1940	1955	1967	2061
		2174	2193											
MESG	005412	596	603	649	654	666	673	756	761	774	787	790	814	817
		836	839	853	856	878	897	927	932	937	942	945	979	1025
		1030	1034	1133	1186#									
MESGA	005430	890	1086	1189#	1196									
MESGAA	005444	1193#	1206	1208										
MESGAB	005516	1192	1205#											
MESGB	005464	1194	1197#											
MESGBA	005514	1199	1202	1204#										
MINSUY=	000100	592#	2025	2026	2027	2037	2038	2039	2049	2050	2051	2118		
MINUSX=	020000	592#	616	619	627	632	1058	1413	1419	1421	1423	1427	1428	1431
		1434	1452	1454	1456	1457	1459	1461	1472	1474	1476	1477	1479	1481
		1492	1494	1496	1497	1499	1501	1512	1514	1516	1517	1519	1521	1532
		1534	1536	1537	1539	1541	1552	1554	1556	1557	1559	1561	1578	1581
		1582	1583	1590	1593	1594	1595	1602	1605	1606	1607	1614	1617	1618
		1619	1626	1629	1630	1631	1638	1641	1642	1643	1650	1653	1654	1655
		1783	1799	1802	1937	1947	1961	1975	1981	2001	2023	2024	2025	2035
		2036	2037	2047	2048	2049	2081	2117	2155	2156	2157	2158		
MINUSY=	020000	592#	1416	1418	1422	1424	1765	1940	1950	1964	1970	1984		
PC	=%000007	372#	448*	456*	526*	552*	611*	623*	644*	694*	696*	698*	700*	701*
		703*	719*	723*	724*	727*	728*	729*	737*	750*	909*	911*	922*	993*
		1014*	1052*	1055*	1061*	1073*	1077*	1080*	1153*	1169*	1171*	1173*	1175*	1177*

```
                        1184#
PNT16A  012240          2154#
PNT16B  012244          2156#
PNT16C  012250          2158#
PNT16D  012254          2160#
POINT = 114000           592#   640    687    905    958   1011   1217   1374   1404   1441   1462   1482   1502
                        1522   1542   1567   1663   1728   1735   1742   1755   1774   1791   1809   1912   1926
                        1941   1953   1965   1977   1989   1997   2016   2059   2075   2172   2191
PSW     001010           398#   509*  1189*
Q     = 001777          1571#  1573   1584#  1585   1596#  1597   1608#  1609   1620#  1621   1632#  1633   1644#
                        1645   1656#
R     = 000777          1572#  1573   1584#  1585   1596#  1597   1608#  1609   1620#  1621   1632#  1633   1644#
                        1645   1656#
RAYLPA  011250           883*   885*  1908#
RAY14A  012004           528*  1082*  2076#
RAY14B  012006           529*  1081*  2077#
RED   = 000003           592#
RELATV= 130000           592#   910   1048   1821   1832   1843   1854   1865   1876   1887   1898   2031   2080
                        2116
RETB    001700           543    562#
RETLP   003550           870    885#
RET117  005206          1128   1139#
RET14   004614          1006   1064#
RET20   005246          1146   1148#
RET21   005230          1137   1144#
R0    =%000000           365#   479    497*   510*   514    516*   520    610*   613*   614*   615*   616*   619*
                         620*   621*   622*   625*   626*   627*   628*   631*   632*   633*   634*   635*   636*
                         637*   640*   641*   642*   643*   684*   699*   702*   704*   705*   706*   709*   712*
                         718*   721*   725*   747*   904*   957*   961*   989*   993   1009*  1011*  1012*  1013*
                        1015*  1016*  1017*  1048*  1049*  1056*  1057*  1058*  1094*  1095*  1096*  1097*  1100*
                        1103*  1104*  1105*  1106*  1109*  1118*  1120   1132*  1156*  1157*
R1    =%000001           366#   480    496*   511*   512    513*   517*   518    519*   612*   617*   624*   629*
                        1047*  1050*  1092*  1099*  1108*  1111*  1139*  1140*  1145   1152   1156   1160
R2    =%000002           367#   481    495*   710*   712    713*   714    722*   726*   740    741*  1072*  1076*
                        1079*  1093*  1151*  1170*  1172*  1174*  1176*
R3    =%000003           368#   482    494*   711*   716*   739*   742*   746*   748*  1071*  1075*  1078*  1152*
                        1168*  1178*  1179*  1180*  1181
R4    =%000004           369#   451*   452*   453*   458    483    493*   524*   571*  1170   1172   1174   1176
                        1181*  1182*  1183*
R5    =%000005           370#   484    492*   649*   654*   756*   761*   927*   932*   937*   942*   945*   964*
                         969*  1025*  1030*  1034*
SCOPE = 104000           373#   595    602    609    662    683    773    780    807    834    851    869    896
                         903    956   1005   1117
SCOPEA  001100           385    437#
SCOPEB  001156           444    451#
SCOPEC  001162           452#  1212
SCOPED  001170           446    454#   507
SCOPEE  001126           441    443#
SCOPEF  001136           438    445#
SETPNT  002252           611    623    640#
SETUP   001536           448    456    526    536#
SETUPA  001622           541    546#
SETUPB  001664           546    554#
SHORTV= 104000           592#   908   2019   2043
SIZE0 = 000400           592#   685   1666
SIZE1 = 000600           592#
```

```
SP      =x000006        371#    454#    479#    480#    481#    482#    483#    484#    485     491#    492     493     494
                        495     496     497     499#    508#    888     1085
SPACE   002730          701     724     746#
START   001356          390     508#
STATSA= 170000          592#    686     699     702     721     725     961     1220    1373    1407    1444    1570    1667
                       1731    1758    1777    1812    1929    2015    2062    2175    2194
STATSB= 174000          592#    685     962     983     985     1666
STCHAR  002666          693#    695#    697#    722     726     731#
STKPTR= 000500          374#    454     499     508
STRA    001400          512#    515
STRB    001424          518#    521
STRC    001456          526#    1147
SWITCH  005556          439#    442#    522#    566#    573#    584#    647     664     799     826     843     860     873
                        976     1022    1068    1200#   1203#   1205    1210#   1215#
SYNOFF= 000010          592#    686     961     1220    1373    1407    1444    1570    1667    1731    1758    1777    1812
                       1929    2015    2062    2175    2194
SYNON = 000014          592#
SYN12   010650          875#    877#    1812#
TAB16A  012016         2081#
TAB16B  012130         2118#
TIMEVT  001074          432#    550#
TKB     001014          400#    562     1139
TKS     001012          399#    538#    545#    1130#
TMEVT1  001076          433#    550     551#
TSAVE   001044          412#    525#    562#    563#    564     567#    569     571     576     588#
XPOS    001060          423#    1066
YPOS    001062          424#    896     1064
.     = 012472          378#    380#    384#    389#    392#    555
```

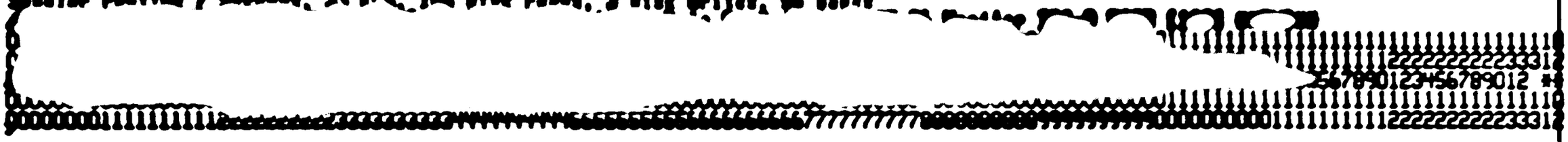
CLEARA	593#	1220	1372	1407	1444	1570	1731	1758	1777	1929	2062	2175	2194
DSTEP	418#	889	1093	1195									
OCTGN	2014#	2020	2032	2[illegible]									
OCTGON	1445#	1465	1485	1505	1525	1545							
SQUARE	1571#	1573	1585	1597	1609	1621	1633	1645					

ADD	513	519	793	820	845	862	967	982	1099	1108	1183				
ASL	453														
ASR	1096	1097	1105	1106											
BEQ	441	541	565	648	715	882	977	990	1069	1098	1107	1194	1202	1208	
BIC	452	538	563	875	887	975	1065	1067	1111	1140	1168	1182			
BIS	545	877	978	1130											
BIT	440	443	540	1201											
BMI	555	568	570												
BNE	438	444	446	515	521	577	618	630	658	665	670	677	717	743	749
	766	795	797	800	803	822	824	827	830	844	847	861	864	874	921
	949	970	974	987	1023	1040	1043	1051	1060	1101	1110	1121	1137	1146	1149
	1155	1192	1199	1206											
BR	589	652	671	676	894	915	966	1028	1074	1112	1138				
CLR	439	522	523	524	525	527	539	549	551	566	573	574	580	835	852
	1018	1092	1093	1122	1123	1144	1161	1189	1200	1209	1210	1211			
CMP	514	520	564	569	576	714	846	863	888	983	1085	1120	1145		
COM	442	542	1158	1203											
DEC	617	629	657	669	676	716	742	748	765	794	796	802	821	823	829
	881	920	948	969	986	1039	1042	1050	1059	1100	1109	1148	1193		
EMT	373														
HALT	378	487	503	556	559	582	586	1143							
INC	713	741	801	808	1070										
JMP	390	458	507	534	638	707	767	890	950	998	1044	1086	1147	1150	1159
	1162	1196	1212												
JSR	448	456	526	596	603	611	623	649	654	666	673	694	696	698	700
	701	703	723	724	727	728	756	761	774	787	790	814	817	836	839
	853	856	878	897	909	911	927	932	937	942	945	979	993	1014	1025
	1030	1034	1055	1073	1077	1080	1133	1153	1169	1171	1173	1175			
MOV	451	454	479	480	481	482	483	484	485	486	491	492	493	494	495
	496	497	498	499	508	509	510	511	512	516	517	518	528	529	530
	531	532	533	536	537	543	544	546	547	549	550	571	572	578	584
	610	612	613	614	615	616	619	620	621	622	624	625	626	627	628
	631	632	633	634	635	636	637	640	641	642	643	646	663	684	685
	686	687	688	689	690	693	695	697	699	702	704	705	706	710	711
	718	721	722	725	726	739	746	754	755	760	781	782	783	784	785
	786	808	809	810	811	812	813	870	871	872	883	885	896	889	891
	904	905	906	907	908	910	912	913	914	917	918	919	924	925	926
	930	931	935	936	940	941	957	958	959	960	961	962	963	964	965
	968	971	972	973	974	985	989	1006	1007	1008	1009	1010	1011	1012	1013
	1015	1016	1017	1019	1020	1047	1048	1049	1054	1056	1057	1058	1064	1066	1071
	1072	1075	1076	1078	1079	1081	1082	1084	1094	1103	1118	1119	1128	1129	1131
	1132	1139	1141	1151	1152	1181	1186	1187	1188	1195					
MOVB	562	691	692	709	712	733	734	735	736	740	747	1124	1125	1126	1127
	1156	1157	1160	1170	1172	1174	1176								
NOP	447	449	455	457	500	501	502	504	505	506	798	825	842	859	994
	995	996	997	999	1000	1001	1197								
RESET	991	992													
ROR	1178	1179	1180												
RTI	450	558	575	579	581	585	1142								
RTS	552	644	719	729	737	744	750	922	1052	1061	1177	1184	1204		
SUB	567	588	1095	1104											
TST	437	445	554	647	664	799	826	843	860	873	976	1022	1068	1136	1154
	1191	1198	1205	1207											
WAIT	1190														
.ASCII	1233	1237	1241	1247	1259	1265	1272	1278	1289	1299	1306	1313	1322	1327	1335
	1340	1346	1352	1670	1683	1696	1709	1815	1826	1837	1848	1859	1870	1881	1892

```
         2065    2070    2071    2073    2074    2178    2183    2202
.ASCIZ   1223    1359    1916    2197
.BYTE    1222    1232    1236    1240    1246    1258    1264    1271    1277    1288    1298    1305    1312    1321    1326
         1334    1339    1345    1351    1358    1669    1681    1694    1707    1814    1824    1835    1846    1857    1868
         1879    1890    1931    1996    2004    2064    2069    2072    2177    2182    2196    2201    2204    2206
.ENABL    360
.END     2210
.EVEN    1367    1919
.LIST       1     356     362     378     592    1584    1596    1608    1620    1632    1644    1656
.MACR     418
.MACRO    593    1445    1571    2014
.NLIST      1     356     363     378     592    1584    1596    1608    1620    1632    1644    1656
.REM        1
.REPT     378    1573    2082    2119
.TITLE    361
.WORD     381     385


ERRORS DETECTED:  0
DEFAULT GLOBALS GENERATED:  0

*DOGTGA,DOGTGA.SEQ/SOL/CRF/DS:ERFZ/EN:ABS=DSKM:DOGTGA.P11
RUN-TIME: 6 12 3 SECONDS
RUN-TIME RATIO: 132/23=5.6
CORE USED:  8K  (15 PAGES)
```

F05

Spooler runtime 7 Seconds, 20 [illegible], 195 disk reads, 2 disk writes, 95 [illegible]