

GT40-41-42-44

VISUAL DISPLAY TEST
MD-11-DDGTG-A

EP DDGTG A-DL A

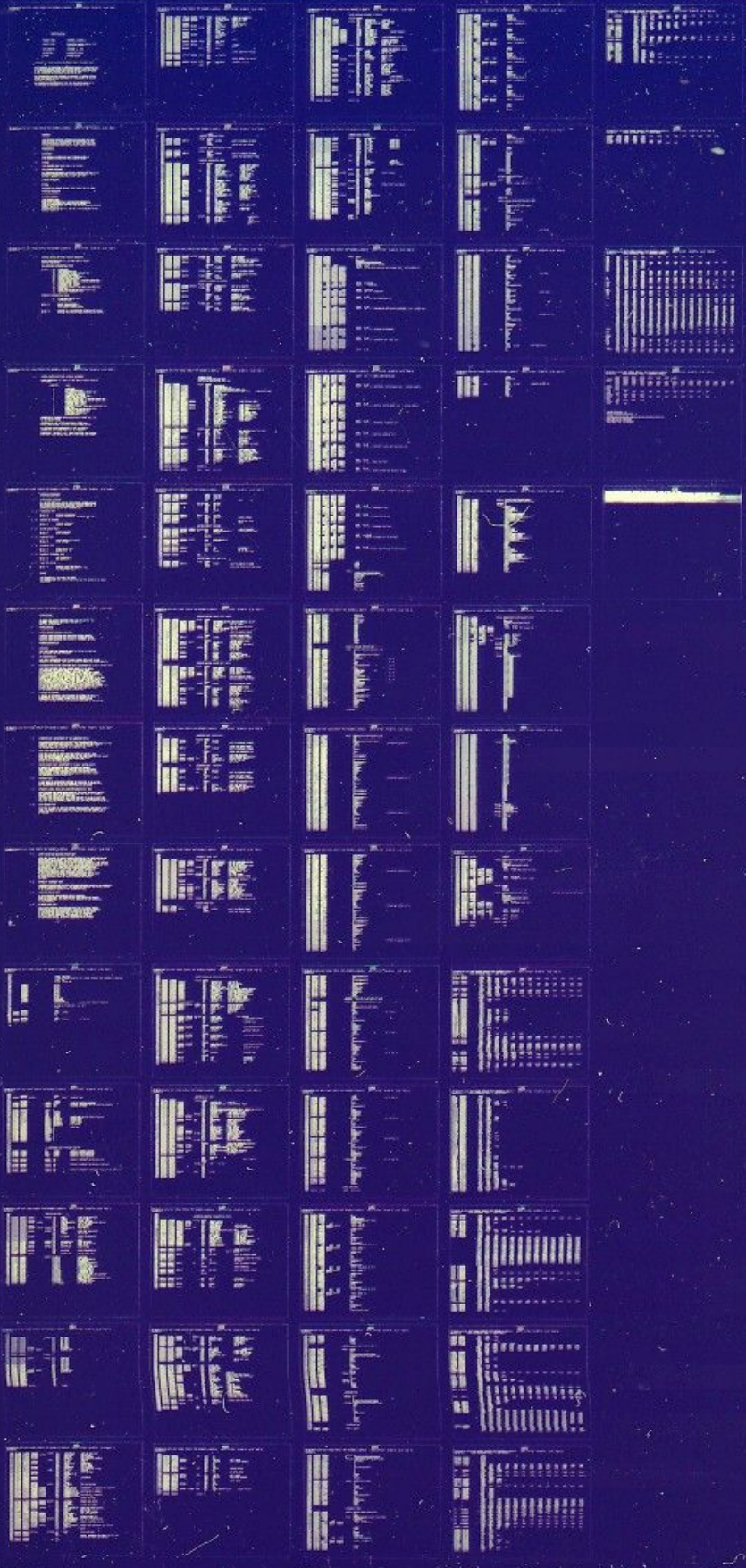
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IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DOGTG-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 EQUIPMENT

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 INTERVENTION 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 REPEATABILITY
02 /PINCUSHION (X AND Y OFFSET ADJ.)
03 /OCTAGONS OR SQUARES
04 /CHARACTER SET (CHAR ADJ.)
05 /DASH LINES AND BLINK
06 /VECTOR LENGTH TEST (X VECTOR LENGTH ADJ.)
07 /VECTOR LENGTH TEST (Y VECTOR LENGTH ADJ.)
10 /PHOSPHOR TEST (HORIZ)
11 /PHOSPHOR TEST (VERT)
12 /INTENSITY LEVELS, SYNC AND LIGHT-PEN TEST
13 /EDGE TEST
14 /SHORT VECTOR AND RELATIVE POINT TEST
15 /GRAPHPLOT INCREMENT TEST

OPERATOR INTERVENTION TESTS

16 /LIGHT-PEN FOLLOW TEST
17 /KEYBOARD ECHO

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

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

4.3 CONTROL SWITCH SETTINGS (DISPLAY KEYBOARD)

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

CHARACTER	TEST
A	DIRECTORY
B	DOT REPEATABILITY
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	SHIFT 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 GRAPHLOT INCREMENT TEST

SW 6 = 0 USE GRAPHLOT X
SW 6 = 1 USE GRAPHLOT 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 CORNER 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 Y RETU'S IN THE OPPOSITE DIRECTION. A SIMILAR SQUIGGLE IS REPEATED STARTING AT LOWER RIGHT CORNER TO THE UPPER LEFT CORNER AND BACK. THE PURPOSE IS TO MAKE CERTAIN THAT THE VECTORS ARE LINE A 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 VISIBLE 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 DRAWN FROM THE SCREEN ORIGIN TO THE OPPOSITE EDGE OF THE SCREEN. THESE VECTORS SHOULD TERMINATE ON THE LINE DRAWN AT THE VIEWING EDGE. IF THE VECTORS DO NOT END ON THE LINE, ADJUST THE APPROPRIATE VECTOR LENGTH POT.
- 9.8 PHOSPHOR TEST
A WIDE BAND OF INTENSIFIED VECTORS IS DISPLAYED TO ALLOW FOR VISUAL INSPECTION OF THE CRT PHOSPHOR. THIS TEST ALSO TEST FOR ANY DISTORTION IN DEFLECTION CROSS-OVER IN THE SCOPE.
- 9.9 INTENSITY LEVEL, SYNC AND LIGHT-PEN SENSITIVITY TEST
EIGHT VECTORS ARE DRAWN USING EACH OF THE EIGHT INTENSITY LEVELS. THE INTENSITY SHOULD BE ADJUSTED SO THAT THE LEVEL 0 IS BARELY VISIBLE. THIS TEST IS ALSO USED TO TEST THE LIGHT PEN SENSITIVITY. ALL LINES ARE SET TO ALLOW A LIGHT PEN HIT. THEN HIT THE SCOPE '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 DRAWN 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 SERIES 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 REPEATABILITY 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 OUTER OCTAGON IS DRAWN USING SHORT VECTOR MODE 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 DISPLAYABLE CHARACTER KEY IS DEPERSED THE CHARACTER IS DISPLAYED ON THE SCREEN. IN SELECTING THE SHIFT-OUT MODE, IF THE KEY DEPERSED 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.

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000005
000006
000007
104000
000500
177570

000024
000026

000030
000032

000024
000026

000030
000032

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

R0=X0
R1=X1
R2=X2
R3=X3
R4=X4
R5=X5
SP=X6
PC=X7
SCOPE=EMT
STKPTR=500
DISPLAY=177570 ;11/45 LIGHT DISPLAY REGISTER

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

. =24
.WORD LOWPWR
340

. =30
.WORD SCOPEA ;EMT RETURN
340

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000200 000200 001356      =200
                                JMP      START ;DISPLAY TEST
001000 001000
001002 172000      GSADD:  =1000
                                172000 ;DISPLAY STARTING ADDRESS
001004 000320      GSVCT:  320 ;DISPLAY INTERRUPT VECTOR STARTING ADDRESS
                                200 ;DISPLAY BR LEVEL
001006 000000      ICNT:    0
001010 177776      PSH:    177776
001012 177560      TKS:    177560
001014 177562      TKB:    177562
001016 012470      DBUF:  BUFFER ;FIRST WORD IN THE DISPLAY BUFFER
001020 012472      DUF1:  BUFFER+2 ;SECOND WORD
001022 012474      DUF2:  BUFFER+4 ;THIRD WORD
001024 012476      DUF3:  BUFFER+6 ;FOURTH WORD
001026 012478      DUF4:  BUFFER+8 ;FIFTH WORD
001030 012480      DUF5:  BUFFER+10
001032 012482      DUF6:  BUFFER+12
001034 012484      DSAVE:  0 ;TEMP REG.
001036 012486      DSAVE1: 0
001038 012488      DSAVE2: 0
001040 012490      DSAVE3: 0
001042 012492      HOLD:  0
001044 012494      TSAVE:  0
001046 000000      CNTR:  0
001050 000000      CHANGE: 0
001052 000000      LOKRB: 0

;GS ADDRESSES AND INTERRUPT VECTORS
001054 172000      DPC:    172000 ;DISPLAY PROGRAM COUNTER
001056 172002      DSR:    172002 ;DISPLAY STATUS REGISTER
001060 172004      XPOS:  172004 ;DISPLAY X AXIS REGISTER
001062 172006      YPOS:  172006 ;DISPLAY Y AXIS REGISTER
001064 000320      DOONE:  320 ;DISPLAY INTERRUPT VECTOR FOR STOP
001066 000322      DOONE1: 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      TIMEVT1: 332

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;MONITOR ROUTINE
435
436
437 001100 005737 002046 SCOPEA: TST KR80 ;TEST IF SW OR "KR8"
438 001104 001014 BNE SCOPEF ;BR IF "KR8"
439 001106 005037 005556 CLR SWITCH ;CLEAR "SWITCH"
440 001112 032737 000100 177570 BIT #100, #DISPLAY ;TEST FOR "HOLD/STOP SWITCH"
441 001120 001402 BEQ SCOPEE ;BR IF CLEARED
442 001122 005137 005556 COM SWITCH ;SET SWITCH
443 001126 032737 000400 177570 SCOPEE: BIT #400, #DISPLAY ;TEST BIT 8
444 001134 001010 BNE SCOPEB
445 001136 005737 001042 SCOPEF: TST HOLD ;TEST FOR "HOLD/STOP"
446 001142 001012 BNE SCOPED ;BR IF SET
447 001144 000240 NOP
448 001146 004737 001536 JSR PC, SETUP ;RESET HOUSEKEEPING
449 001152 000240 NOP
450 001154 000002 RTI ;EXIT
451 001156 013704 177570 SCOPEB: MOV #DISPLAY, R4 ;READ SWITCHES
452 001162 042704 177760 SCOPEC: BIC #177760, R4 ;MASK TO BITS 4-15
453 001166 006704 R4 ;MOVE LEFT
454 001170 012706 000500 SCOPED: MOV #STKPTR, SP ;RESET STACK
455 001174 000240 NOP
456 001176 004737 001536 JSR PC, SETUP ;RESET HOUSEKEEPING
457 001202 000240 NOP
458 001204 000174 001210 JMP #DISPTC(R4) ;JMP TO THAT TEST
459
460 001210 002052 DISPTC: FILE0+2 ;DIRECTORY
461 001212 002064 FILE1+2 ;DOT REPEATIBILITY
462 001214 002076 FILE2+2 ;PINCL SHION
463 001216 002342 FILE3+2 ;OCTAGONS OR SQUARES
464 001220 002416 FILE4+2 ;CHARACTER SET
465 001222 003026 FILE5+2 ;DASH LINES AND BLINK
466 001224 003040 FILE6+2 ;X VECTOR LENGTH
467 001226 003172 FILE7+2 ;Y VECTOR LENGTH
468 001230 003324 FILE10+2 ;X PHOSPHOR TEST
469 001232 003400 FILE11+2 ;Y PHOSPHOR TEST
470 001234 003454 FILE12+2 ;INTENSITY LEVEL AND LIGHTPEN
471 001236 003616 FILE13+2 ;EDGE SQUARES
472 001240 003630 FILE14+2 ;SHORT VECTOR RELATIVE POINT TEST
473 001242 004110 FILE15+2 ;GRAPHPLOT TEST
474 001244 004344 FILE16+2 ;LIGHT-PEN FOLLOW
475 001246 005054 FILE17+2 ;KEY BOARD ECHO
476

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478									
479	001250	010046			LOWPWR:	MOV	R0	-(SP)	
480	001252	010146				MOV	R1	-(SP)	
481	001254	010246				MOV	R2	-(SP)	
482	001256	010346				MOV	R3	-(SP)	
483	001260	010446				MOV	R4	-(SP)	
484	001262	010546				MOV	R5	-(SP)	
485	001264	010637	001300			MOV	SP	LOWSV	
486	001270	012737	001302	000024		MOV	#HIGPWR, 2#24		
487	001276	000000				HALT			
488									
489	001300	000000			LOWSV:	0			
490									
491	001302	013706	001300		HIGPWR:	MOV	LOWSV, SP		
492	001306	012605				MOV	(SP)+, R5		
493	001310	012604				MOV	(SP)+, R4		
494	001312	012603				MOV	(SP)+, R3		
495	001314	012602				MOV	(SP)+, R2		
496	001316	012601				MOV	(SP)+, R1		
497	001320	012600				MOV	(SP)+, R0		
498	001322	012737	001250	000024		MOV	#LOWPWR, 2#24		
499	001330	012706	000500			MOV	#STKPTR, SP		
500	001334	000240				NOP			
501	001336	000240				NOP			
502	001340	000240				NOP			
503	001342	000000				HALT			
504	001344	000240				NOP			
505	001346	000240				NOP			
506	001350	000240				NOP			
507	001352	000137	001170			JMP	SCOPED		

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508 001356 012706 000500          START:  MOV    #STKPTR, SP      ;SET UP THE STACK
509 001362 012777 000340 177420  MOV    #340, @PSW      ;RAISE PSW
510 001370 012700 001054          MOV    #OPC, R0       ;GET POINTER
511 001374 013701 001000          MOV    GSADD, R1      ;GET SUPPLIED ADDRESS
512 001400 010120 000002          STRA:  MOV    R1, (0)+  ;UPDATE
513 001402 062701 000002          ADD    #2, R1         ;THE
514 001406 022700 001064          CMP    #OPC+10, R0   ;ADDRESSES
515 001412 001372 000002          BNE    STRA          ;UNTIL DONE
516 001414 012700 001064          MOV    #DDONE, R0    ;GET POINTER
517 001420 013701 001002          MOV    GSVCT, R1     ;GET SUPPLIED VECTOR
518 001424 010120 000002          STRB:  MOV    R1, (0)+  ;UPDATE
519 001426 062701 000002          ADD    #2, R1         ;THE VECTORS
520 001432 022700 001100          CMP    #DDONE+14, R0
521 001436 001372 000002          BNE    STRB
522 001440 005037 005556          CLR    SWITCH        ;HOUSEKEEP
523 001444 005037 001042          CLR    HOLD
524 001450 005037 000002          CLR    R4
525 001452 005037 001044          CLR    TSAVE
526 001456 005037 001536          STRC:  JSR    PC, SETUP ;SET UP VECTORS
527 001462 005037 001042          CLR    HOLD
528 001466 012737 001000 012004  MOV    #1000, RAY14A  ;HOUSEKEEP X, Y ORIGIN FOR LIGHTPEN
529 001474 012737 000000 012006  MOV    #600, RAY14B
530 001502 012737 000000 011764  MOV    #30060, DLT14A ;INITIALIZE X READOUT
531 001510 012737 000000 011766  MOV    #30060, DLT14A+2
532 001516 012737 000000 011776  MOV    #30060, DLT14B ;INITIALIZE Y READOUT
533 001524 012737 000000 012000  MOV    #30060, DLT14B+2
534 001532 000137 000000          JMP    FILED         ;START THE TEST
535
536 001536 012737 000062 000060  SETUP:  MOV    #62, @#60    ;RESET KRB VECTOR
537 001544 012737 000000 000052  MOV    #0, @#62
538 001552 042777 000100 177232  BIC    #100, @TKS    ;CLEAR INT ENABLE
539 001560 005037 000046          CLR    KRB0
540 001564 032737 000200 177570  BIT    #200, @DISPLAY ;TEST FOR "KRB" CONTROL
541 001572 001413          BEQ    SETUPA       ;BR IF NOT
542 001574 005137 000204          COM    KRB0         ;SET "KRB" CONTROL
543 001600 012737 001700 000060  MOV    #RET8, @#60   ;SET UP "KRB" INT
544 001606 012737 000340 000062  MOV    #340, @#62
545 001614 052777 000100 177170  BIS    #100, @TKS    ;ENABLE "KRB" INT
546 001622 012777 001664 177234  SETUPA: MOV    #SETUPB, @DDONE ;SET UP GT DONE VECTOR
547 001630 012777 000340 177230  MOV    #340, @DDONE1
548 001636 013777 001072 177224  MOV    @LPVCT1, @LPVCT ;RESET LIGHT-PEN VECTOR
549 001644 005077 177222          CLR    @LPVCT1
550 001650 013777 001076 177216  MOV    @TMEVT1, @TMEVT ;RESET TIME-OUT/SHIFT OUT VECTOR
551 001656 005077 177214          CLR    @TMEVT1
552 001662 000207          RTS                 ;EXIT
553
554 001664 005777 177166          SETUPB: TST    @OSR    ;TEST FOR STOP
555 001670 103401          BMI    .+4
556 001672 000000          HALT
557
558 001674 000002          RTI
559 001676 000000          HALT

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560 001700 117737 177110 001044 RETB: MOVB 0TKB, TSAVE ; READ THE CHARACTER
561 001706 042737 177600 001044 BIC 0177600, TSAVE ; MASK TO 7 BITS
562 001714 022737 000015 001044 CMP 015, TSAVE ; TEST FOR "CR"
563 001722 001440 BEQ KYT3 ; BR IF
564 001724 005037 005556 CLR SWITCH ; CLEAR "SWITCH"
565 001730 162737 000101 001044 SUB 0101, TSAVE ; MAKE 0-77
566 001736 100426 KYT5: BHI KYT1 ; <A
567 001740 022737 000017 001044 CMP 017, TSAVE ; >P
568 001746 100412 BHI KYT2
569 001750 013704 001044 MOV TSAVE, R4
570 001754 012737 177777 001050 MOV 0-1, CHANGE
571 001762 005037 005556 CLR SWITCH
572 001766 005037 001042 CLR HOLD
573 001772 000002 RTI ; EXIT
574 001774 022737 000076 001044 KYT2: CMP 076, TSAVE
575 002002 001015 BNE KYT4
576 002004 012737 177777 001042 MOV 0-1, HOLD ; RUBOUT
577 002012 000002 RTI ; EXIT
578 002014 007337 001042 KYT1: CLR HOLD
579 002022 000000 HALT ; FATAL ERROR RTI FAILED
580 002024 012737 177777 005556 KYT3: MOV 0-1, SWITCH
581 002032 000002 RTI
582 002034 000000 HALT ; FATAL ERROR, RTI FAILED
583 002036 162737 000040 001044 KYT4: SUB 040, TSAVE ; CONVERT LC TO UC
584 002044 000734 BR KYT5
585 002046 000000 KR80: 0

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```

;EXECUTE DIRECTORY FRAME
FILED: SCOPE
      JSR      5,MSG      ;EXIT TO DISPLAY A FRAME
      1000
      FRMD      ;USING THE DIR. FRAME

;EXECUTE DOT REPEATIBILITY FRAME
FILE1: SCOPE
      JSR      5,MSG      ;EXIT TO DISPLAY A FRAME
      10000
      FRM1      ;USING THE DOR REPEAT FRAME

;EXECUTE PINCUSHION FRAME
FILE2: SCOPE
      MOV      @BUFFER,RO      ;LOAD START ADDRESS
      JSR      PC,SETPNT      ;LOAD 0,0 ORIGIN
      MOV      @20,R1      ;SETUP COUNT
15:   MOV      @INTX,(RO)+      ;LOAD INT LINE
      MOV      @MAXY,(RO)+      ;MAX Y
      MOV      @100,(RO)+      ;LOAD DELTA X
      MOV      @MINUSX+MAXY,(RO)+ ;LOAD - MAX Y
      DEC      R1      ;FINISHED ?
      B'E     15      ;BR IF NOT
      MOV      @MINUSX+1,(RO)+ ;GO BACK 1 UNIT
      MOV      @0,(RO)+
      MOV      @INTX,(RO)+
      MOV      @MAXY,(RO)+
25:   JSR      PC,SETPNT      ;PLOT LAST LINE
      MOV      @MAXY+1/100,R1 ;SET ORIGIN
      MOV      @INTX+MAXX,(RO)+ ;SETUP COUNT
      MOV      @0,(RO)+      ;LOAD DELTA X MAX
      MOV      @MINUSX+MAXX,(RO)+ ;LOAD DELTA Y = 0
      MOV      @100,(RO)+      ;RETRACE
      DEC      R1      ;LOAD DELTA Y OF 100
      B'E     25      ;FINISHED ?
      MOV      @0,(RO)+      ;BR IF NOT
      MOV      @MINUSX+1,(RO)+
      MOV      @INTX+MAXX,(RO)+ ;PLOT LAST LINE
      MOV      @0,(RO)+
      MOV      @0STOP,(RO)+ ;LOAD STOP
      MOV      @0JMP,(RO)+ ;LOAD JUMP
      JMP      FILE2A

SETPNT: MOV      @POINT!INT4,(RO)+ ;LOAD POINT
      MOV      @0,(RO)+      ; AT X
      MOV      @0,(RO)+      ; AT Y
      MOV      @LONGV,(RO)+ ;LONG VECTOR
      RTS      PC      ;EXIT

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645
646 002274 012737 004000 001046 FILE2A: MOV      @4000,CNTR      ;LOAD COUNTER
647 002302 005737 005556 FILE2B: TST      SWITCH      ;TEST SWITCH
648 002306 001405 FILE2C: BEQ      FILE2C      ;BR IF SUBTEST NOT SELECTED
649 002310 004537 005412 JSR      RS,MSG      ;EXIT TO DISPLAY FRAME
650 002314 000001
651 002316 012470 BUFFER      ;USING THE CROSS MATCH PATTERN
652 002320 000404 BR        FILE2D      ;BR
653
654 002322 004537 005412 FILE2C: JSR      RS,MSG      ;EXIT TO DISPLAY FRAME
655 002326 000001
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 002344 005737 005556 FILE3A: TST      SWITCH
665 002346 001010 BNE      FILE3B
666 002348 004537 005412 JSR      S,MSG      ;BRANCH IF SUB-TEST
667 002350 000001 ;DISPLAY TEST
668 002352 007334 FRME3     ;FRAME # 3
669 002354 005337 001046 DEC      CNTR      ;DECREMENT COUNTER
670 002356 001366 BNE      FILE3A      ;BRANCH IF NOT COMPLETE
671 002358 000407 BR        FILE4
672 ;EXIT TO NEXT TEST
673 002376 004537 005412 FILE3B: JSR      S,MSG      ;DISPLAY TEST
674 002402 000001
675 002404 007724 FRME3A    ;FRAME # 3A
676 002406 005337 001046 DEC      CNTR      ;DECREMENT COUNTER
677 002412 001356 BNE      FILE3A      ;BRANCH IF NOT COMPLETE

```

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683 002414 104000
684 002416 012700 012470
685 002420 012720 174400
686 002428 012720 170052
687 002436 012720 117124
688 002444 012720 000000
689 002452 012720 001700
690 002460 012720 100000
691 002468 112720 000017
692 002476 112720 000017
693 002484 012737 000100 002666
694 002492 004737 000024
695 002500 012737 000140 002666
696 002508 004737 000024
697 002516 012737 000100 002666
698 002524 004737 000024
699 002532 012720 170040
700 002540 004737 000064
701 002548 004737 000030
702 002556 012720 170060
703 002564 004737 000054
704 002572 012720 170000
705 002580 012720 160000
706 002588 012720 012470
707 002596 000137 002746
708
709 002604 112720 000016 LOADSP: MOV 816,(R0)+
710 002612 012702 000020 MOV 80,R2 ;SET INITIAL SHIFT OUT CHAR
711 002620 012703 000037 MOV 837,R3 ;LOAD COUNT
712 002628 112720 000000 19: MOV 82,R2 ;LOAD CHAR
713 002636 000000 28: INC R2
714 002644 002702 000017 CMP 817,R2 ;TEST FOR SI
715 002652 001774 BEQ 23 ;BR IF SI =17
716 002660 005303 DEC R3 ;FINISHED ?
717 002668 001371 BNE 19 ;BR IF NOT
718 002676 012720 020017 MOV 820017,(R0)+ ;LOAD SHIFT-IN SPACE
719 002684 000207 RTS PC ;EXIT
720
721 002692 012720 170040 LOADBF: MOV 8STATSA:ITAL0,(R0)+ ;LOAD NORMAL FONT
722 002700 013702 000066 MOV STCHAR,R2 ;GET STARTING CHAR
723 002708 004737 0002712 JSR PC,FILLIT ;LOAD THE CHARACTERS
724 002716 004737 0002730 JSR PC,SPACE ;INSERT SPACES
725 002724 012720 170060 MOV 8STATSA:ITAL1,(R0)+ ;LOAD ITALICS FONT
726 002732 013702 002666 MOV STCHAR,R2 ;GET STARTING CHARACTER
727 002740 004737 002712 JSR PC,FILLIT ;LOAD THE CHARACTERS
728 002748 004737 002670 JSR PC,CRLF ;INSERT CR-LF
729 002756 000207 RTS PC ;EXIT
730
731 002666 000000 STCHAR: 0
732
733 002670 112720 000015 CRLF: MOV 815,(0)+

```

```

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

```

```

FILE4: SCOPE
MOV 8BUFFER,R0
MOV 8STATSB:SIZE,(0)+
MOV 8STATSA:ITAL0:SYNOFF:GREEN,(0)+
MOV 8POINT:INT4:LPOFF:BLKOFF:LINED,(0)+ ;LOAD POINT MPDE
MOV 80,(0)+
MOV 8MAXY-77,(0)+
MOV 8CHAR,(0)+
MOV 817,(0)+
MOV 817,(0)+
MOV 8100,STCHAR ;LOAD INITIAL CHAR.
JSR PC,LOADCF ;LOAD INITIAL LC CHAR
MOV 8140,STCHAR ;LOAD LINE
JSR PC,LOADBF ;LOAD NUMBERS AND PUNCT
MOV 840,STCHAR ;LOAD LINE
JSR PC,LOADCF ;LOAD NORMAL FONT
MOV 8STATSA:ITAL0,(R0)+ ;LOAD SPECIAL CHARS
JSR PC,LOADSP ;INSERT SPACES
JSR PC,SPACE ;LOAD ITALICS FONT
MOV 8STATSA:ITAL1,(R0)+ ;LOAD SPECIAL
JSR PC,LOADSP ;LOAD DSTOP
MOV 80STOP,(R0)+
MOV 80JMP,(R0)+
MOV 8BUFFER,(R0)+
JMP FILE4

```

```

LOADSP: MOV 816,(R0)+
MOV 80,R2 ;SET INITIAL SHIFT OUT CHAR
MOV 837,R3 ;LOAD COUNT
19: MOV 82,R2 ;LOAD CHAR
28: INC R2
CMP 817,R2 ;TEST FOR SI
BEQ 23 ;BR IF SI =17
DEC R3 ;FINISHED ?
BNE 19 ;BR IF NOT
MOV 820017,(R0)+ ;LOAD SHIFT-IN SPACE
RTS PC ;EXIT

```

```

LOADBF: MOV 8STATSA:ITAL0,(R0)+ ;LOAD NORMAL FONT
MOV STCHAR,R2 ;GET STARTING CHAR
JSR PC,FILLIT ;LOAD THE CHARACTERS
JSR PC,SPACE ;INSERT SPACES
MOV 8STATSA:ITAL1,(R0)+ ;LOAD ITALICS FONT
MOV STCHAR,R2 ;GET STARTING CHARACTER
JSR PC,FILLIT ;LOAD THE CHARACTERS
JSR PC,CRLF ;INSERT CR-LF
RTS PC ;EXIT

```

```

STCHAR: 0
CRLF: MOV 815,(0)+

```

F02

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734 002674 112720 000012      MOVB      #12,(0)+
735 002700 112720 000012      MOVB      #12,(0)+
736 002704 112720 000012      MOVB      #12,(0)+
737 002710 000207      RTS          PC          ;EXIT
738
739 002712 012703 000040      FILLIT:  MOV      #40,R3
740 002716 110720      FILLA:  MOVB      R2,(0)+
741 002720 002732      INC       R2
742 002724 005303      DEC       R3
743 002728 001374      BNE      FILLA
744 002732 000207      RTS          7
745
746 002736 012703 000010      SPACE:  MOV      #10,R3
747 002740 112720 000040      IS:     MOVB      #40,(R0)+ ;LOAD A SPACE
748 002744 005303      DEC       R3
749 002748 001374      BNE      IS           ;BR IF NOT DONE
750 002752 000207      RTS          PC          ;EXIT
751
752      ;ACTUAL DISPLAY ROUTINE
753
754 002746 012737 001000 003022  FILE4A:  MOV      #1000,10$ ;LOAD A COUNTER
755 002750 012737 001700 012500  4$:     MOV      #MAXY-77,BUFFER+10 ;LOAD STARTING POINT
756 002754 004537 005412      JSR      RS,MSG
757 002758 000001      1
758 002762 012470      BUFFER
759
760 002772 012737 000400 012500      MOV      #400,BUFFER+10
761 002776 004537 005412      JSR      RS,MSG
762 002780 000001      1
763 002784 012470      BUFFER
764
765 003010 005337 003022      DEC      10$ ;FINISHED ?
766 003014 001357      BNE      4$ ;BR IF NOT
767 003018 000137 003024      JMP      FILES ;GO TO NEXT TEST
768
769 003022 000000      10$:    0
770
771      ;EXECUTE DASH LINES AND BLINK
772
773 003024 104000      FILES:  SCOPE      5,MSG ;EXIT TO DISPLAY A FRAME
774 003028 004537 005412      JSR      10000
775 003032 010000      FRAMES ;USING THE DASH AND BLINK FRAME
776 003036 010174

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003350

104000
010506
005412
005412
005556
000001 010506
002000 010506
104000
005037 010550
004537 005412
000050
010544
004537 005412
000001
010604
000240
005737 005556
001364
000001 010550
022737 010550
001355

;PHOSPHOR TEST <HORIZONTAL>

```
FILE10: SCOPE
D7A: CLR DELTX7
      JSR 5,MSG ;EXIT TO DISPLAY A FRAME
      SO
      FRAME10 ;USING THE HORIZ FRAME
      JSR 5,MSG ;EXIT TO DISPLAY A FRAME
      |
      FRM10 ;USING THE PERIMETER BOX
      NOP
      TST SWITCH ;TEST THE "SWITCH"
      BNE D7A ;BR IF FREEZE THE MOVEMENT
      AND #1,DELTX7 ;UPDATE THE X ORIGIN
      C 2 #2000,DELTX7 ;TEST IF THE END
      BNE D7A ;BR IF NOT
```

;PHOSPHOR TEST <VERTICAL>

```
FILE11: SCOPE
D7D: CLR DELTY7
      JSR 5,MSG ;EXIT TO DISPLAY A FRAME
      SO
      FRM11 ;USING THE VERT FRAME
      JSR 5,MSG ;EXIT TO DISPLAY A FRAME
      |
      FRM10 ;USING THE PERIMETER BOX
      NOP
      TST SWITCH ;TEST THE "SWITCH"
      BNE D7D ;BR IF FREEZE THE MOVEMENT
      ADD #1,DELTY7 ;UPDATE THE Y ORIGIN
      CMP #MAXY+1,DELTY7 ;TEST IF THE END
      BNE D7D ;BR IF NOT
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866
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869 003452 104000
870 003454 012777 003550 175406
871 003462 013777 001004 175432
872 003470 012737 004000 001032
873 003476 005737 005556
874 003502 001004
875 003504 042737 000004 010650
876 003512 000403
877 003514 052737 000004 010650
878 003522 004537 005412
879 003526 000001
880 003530 010642
881 003532 005337 001032
882 003536 001423
883 003540 012737 173400 011250
884 003546 000753
885 003550 012737 164000 011250
886 003556 017737 175300 011262
887 003562 042737 176000 011262
888 003572 022626
889 003574 012777 000001 175252
890 003582 000137 005430
891 003606 013777 001072 175254
892
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896 003614 104000
897 003616 004537 005412
898 003622 010000
899 003624 011312

;INTENSITY LEVEL TEST
FILE12: SCOPE
MOV #RETLP,ALPVCT ;SET UP LIGHT-PEN VECTOR
MOV G,ALPVCT1 ;SET UP BR LEVEL
MOV #4000,DSAVE ;SET UP A EXECUTION COUNT
FLE12A: TST SWITCH ;TEST THE "SWITCH"
BNE FLE12B ;BR IF SET "SYNC"
BIC #4,SYN12 ;ENSURE CLEAR "SYNC"
BR FLE12C ;BY PASS
FLE12B: BIS #4,SYN12 ;SET THE "SYNC"
FLE12C: JSR 5,MSG ;EXIT TO DISPLAY FRAME
1
FRAME12 ;USING THE "INTENSITY" FRAME
DEC DSAVE ;FINISHED?
BEQ FLE.20 ;YES, EXIT
MOV #DSTOP,RAYLPA ;NO, RESET MESSAGE
BR FLE12A ;BR BACK
RETLP: MOV #ONOP,RAYLPA ;LIGHT-PEN HIT
MOV #YPOS,LPPNT ;READ Y POSITION
BIC #176000,LPPNT ;MASK THE BITS
CMP (SP)+,(SP)+ ;POP THE STACK
MOV #1,OPC ;SINGLE STEP THE DISPLAY
JMP MSGA ;JUMP TO WAIT
FLE12D: MOV LPVCT1,ALPVCT ;RESET THE LIGHT-PEN VECTOR

;EXECUTE EDGE TEST
FILE13: SCOPE
JSR 5,MSG ;EXIT TO DISPLAY FRAME
10000
FRAME13 ;USING THE "EDGE" FRAME
  
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;SHORT VECTOR AND RELATIVE POINT TEST

FILE14: SCOPE

```

MOV #BUFFER,RO ;SET UP RO
MOV #POINT,(0)+ ;SET UP INITIAL
MOV #240,(0)+ ;X POSITION
MOV #MAXY+1/2,(0)+ ;Y POSITION
MOV #SHORTV!INT4!LINED,(0)+ ;LOAD "SHORT VECTOR"
JSR PC,LOADVT ;LOAD THE DISPLAY PATTERN
MOV #RELATV,(0)+ ;LOAD "RELATIVE POINT"
JSR PC,LOADVT ;LOAD THE DISPLAY PATTERN
MOV #OSTOP,(0)+ ;LOAD "DISPLAY STOP"
MOV #DJMP,(0)+ ;LOAD "DISPLAY JUMP"
MOV #BUFFER,(0)+ ;TO THE BUFFER ADDRESS
BR FIL14A ;BR TO THE FRAME

LOADVT: MOV #24,CNTR ;LOAD A COUNTER
LADVT: MOV #INTX+77,(0)+ ;LOAD A DELTA Y
MOV #4177,(0)+ ;LOAD A DELTA X,Y
DEC CNTR ;FINISHED?
E IE ;BR IF NOT
LADVT ;EXIT
RTS PC

FIL14A: MOV #4000,105 ;LOAD COUNTER
IS: MOV #0,FRM14A ;LOAD FIRST OCTAGON
MOV #0,FRM14B
JSR RS,MSG ;DISPLAY OCT.
I
FRME14
MOV #1400,FRM14A ;LOAD SECOND OCTAGON
MOV #200,FRM14B
JSR RS,MSG ;DISPLAY 2ND OCT.
I
FRME14
MOV #1400,FRM14A ;LOAD THIRD OCTAGON
MOV #MAXY-377,FRM14B
JSR RS,MSG
I
FRME14
MOV #200,FRM14A ;LOAD FOURTH OCTAGON
MOV #MAXY-377,FRM14B
JSR RS,MSG ;DISPLAY 4TH OCT.
I
FRME14
JSR RS,MSG ;DISPLAY BAR
I
BUFFER
DEC 105 ;FINISHED?
BNE IS ;BR IF NOT
JMP FILE15 ;NEXT TEST

105: 0

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1001

004106 104000
004110 012700
004111 012700
004112 012700
004120 012720
004127 012720
004128 012720
004138 012720
004145 012720
004146 012720
004150 012720
004150 012737
004158 000403
004158 052737
004158 013700
004172 005337
004174 001371
004176 012700
004176 012700
004176 012720
004212 012737
004220 042777
004226 005737
004227 001403
004234 052777
004242 004537
004246 000001
004247 012700
004250 052777
004250 022777
004250 001365
004270 012777
004276 005337
004302 001346
004304 013700
004310 001407
004312 000005
004314 000005
004316 012710
004320 000240
004322 000240
004324 000240
004326 000240
004330 000137
004334 000240
004336 000240
004340 000240

012470
117500
000000
000000
100000
174100
120000
000000
000000
001032
000020
001032
005337
001371
173400
180000
012470
000200
004000
005556
004000
005412
000001
000001
174200
174540
174100
001032
000042

LOGICAL:

HERE:

;GRAPH PLOT X-Y TEST

FILE15: SCOPE

```

MOV #BUFFER,R0 ;LOAD R0
MOV #POINT,INT7,(0)+ ;LOAD INITIAL POINT
MOV #0,(0)+
MOV #0,(0)+
MOV #STATSA,ITALO,DISYNOFF,GREEN,(R0)+ ;RESET THE STATUS A
MOV #STATSB,INCR,(0)+ ;LOAD INITIAL STATUS B
MOV #GRAPHX,(0)+ ;LOAD GRAPH X INST
MOV #40,R0 ;LOAD STARTUP COUNT
MOV #0,DONE ;LOAD INITIAL PLOT
BR #0,DONE
IS: ADD #20,DSAVE ;UPDATE PLOT POINT
DS: MOV #SAVE,(0)+ ;SAVE THE POINT
RS DEC RS ;FINISHED?
BNE IS ;BR IF NOT
MOV #DSTOP,(0)+ ;LOAD "DSTOP"
MOV #DUMP,(0)+ ;LOAD "DUMP"
MOV #BUFFER,(0)+ ;LOAD RETURN
MOV #200,DSAVE ;LOAD POINT COUNT
DFL15D: BIC #4000,DSBUF5 ;ENSURE "GRAPHX"
TST SWITCH ;TEST SWITCH
BEQ DFL15B ;BR IF GRAPHX
BIS #4000,DSBUF5 ;SET GRAPHY
DFL15B: JSR S,MSG ;EXIT TO DISPLAY A FRAME
J BUFFER ;USING THE GENERATED PATTERN
F D #1,DSBUF4 ;UPDATE INCREMENT
LMP #STATSB+200,DSBUF4 ;TEST IF LAST INCREMENT
BNE DFL15B ;BR IF NOT
MOV #STATSB,INCR,DSBUF4 ;LOAD INCREMENT
DEC DSAVE ;FINISHED 10 SEC?
BNE DFL15D ;BR IF NOT

MOV #42,R0
BEQ HERE ;ACT-11/DDP-11
RESET
RESET
LOGICAL: JSR PC,(R0)
NOP
NOP
NOP
NOP
NOP
NOP
NOP
NOP
NOP
NOP
NOP

```



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1002
1003 ;OPERATOR OPERATOR INTERVENTION TESTS
1004
1005 004342 104000 FILE16: SCOPE
1006 004344 012777 004614 174516 MOV #RET14,AL,PVCT
1007 004352 013777 001004 174512 MOV #GENERAL,AL,PVCT1
1008 004360 012737 000100 001034 MOV #100,DSAVE1 ;SET UP COUNT
1009 004366 012700 012470 1S: MOV #BUFFER,R0 ;LOAD START ADDR.
1010 004372 012737 000100 001032 MOV #100,DSAVE
1011 004400 012720 117744 MOV #POINT,INT7!LPOH!LINE0,(R0)+ ;LOAD POINT
1012 004404 012720 000700 MOV #700,(R0)+ ;LOAD X POINT
1013 004410 012720 000474 MOV #474,(R0)+ ;LOAD Y POINT
1014 004414 004737 004556 JSR PC,LOADUP ;LOAD UP THE BUFFER
1015 004420 012720 173400 MOV #DSTOP,(R0)+ ;LOAD DSTOP
1016 004424 012720 160000 MOV #DJMP,(R0)+ ;LOAD DJUMP
1017 004430 012720 012470 MOV #BUFFER,(R0)+ ;LOAD RETURN ADDRESS
1018 004434 005237 005050 CLR HITCNT ;CLEAR HIT COUNT
1019 004440 012737 000050 012374 MOV #30060,FRM16B-2 ;PRESET THE READOUT
1020 004446 012737 000060 012372 MOV #30060,FRM16B-4
1021
1022 004454 005737 005556 4S: TST SWITCH ;TEST SWITCH BIT
1023 004460 001005 BNE 6S ;BR IF SUBTEST
1024
1025 004462 004537 005412 JSR R5,MESG ;EXIT TO DISPLAY FRAME
1026 004466 000100 I00
1027 004470 011714 FRM16 ;USINT THE LIGHT-PEN FRAME
1028 004472 000770 BR 4S ;BR BACK
1029
1030 004474 004537 005412 6S: JSR R5,MESG ;EXIT TO DISPLAY FRAME
1031 004500 000001 I
1032 004502 012302 FRM16A ;ASCII SUBTITLE
1033
1034 004504 004537 005412 JSR R5,MESG ;EXIT TO DISPLAY FRAME
1035 004510 000001 I
1036 004512 012470 BUFFER
1037
1038
1039 004514 005337 001032 DEC DSAVE ;FINISHED ?
1040 004520 001355 BNE 4S ;BR IF NOT MINI-LOOP
1041
1042 004522 005337 001034 DEC DSAVE1 ;FINISHED ?
1043 004526 001317 BNE 1S ;BR IF NOT
1044 004530 000137 004342 JMP FILE16 ;RESTART
1045

```



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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

```

```

1115
1116
1117 005052 104000
1118 005054 012700 012470
1119 005060 012720 173400
1120 005064 022700 013470
1121 005070 001373
1122 005072 005037 001052
1123 005076 005037 001032
1124 005102 112737 000060 012461
1125 005110 112737 000060 012462
1126 005116 112737 000060 012463
1127 C 5124 112737 000060 012464
1128 005132 012737 005206 000060
1129 005140 012737 000340 000052
1130 005146 052777 000100 173636
1131 C 5154 012737 000700 005330
1132 C 5162 012700 012470
1133 C 5166 004537 005412
1134 C 5172 000001
1135 C 5174 012404
1136 C 5176 005737 001052
1137 C 5178 001012
1138 C 5180 000770
1139 C 5182 017701 173602
1140 C 5184 042701 177600
1141 C 5186 012737 177777 001052
1142 C 5188 000002
1143 C 5190 000000
1144 005230 000037 001052
1145 005234 022701 000003
1146 005240 001002
1147 C 5242 000137 001456
1148 C 5244 005337 005330
1149 005252 001002
1150 005254 000137 005054
1151 C 5256 012702 012465
1152 005264 010103
1153 005266 004737 005332
1154 005272 005737 001032
1155 005276 001007
1156 005300 110120
1157 005302 112710 000017
1158 005306 005137 001032
1159 005312 000137 005166
1160 005316 110120
1161 005320 005037 001032
1162 005324 000137 005166
1163
1164
1165 005330 000200

```

;ECHO ROUTINE KEYBOARD TO DISPLAY

```

FILE17: SCOPE
ECHOA: MOV @BUFFER,RO ;LOAD RO
MOV @DSTOP,(R0)+ ;MOV "DSTOPS"
CMP @BUFFER+1000,R0 ;THRUOUT THE
BNE ECHOA ;BUFFER
CLR LOKRB ;HOUSE
CLR DSAVE ;KEEPING
MOV @60,KBOCT-4 ;PRESET READOUT
MOV @60,KBOCT-3
MOV @60,KBOCT-2
MOV @60,KBOCT-1
MOV @RET117,@@60 ;LOAD KEYBOARD VECTOR
MOV @340,@@62
BIS @100,@TKS ;ENABLE INTERRUPT
MOV @700,CHRCNT ;LOAD CHAR COUNT
MOV @BUFFER,R0 ;RET R0
ECHO: JSR S,MSG ;EXIT TO DISPLAY A FRAME
I
FRAME17 ;USING THE KEYBOARD HEADER
TST LOKRB ;UPDATE A CHAR?
BNE RET21 ;BR IF YES
BR ECHO
RET117: MOV @TKB,R1 ;GET A CHAR
BIC @177600,R1 ;MASK
MOV @-1,LOKRB ;SET (FLAG)
RTI ;EXIT
HALT
RET21: CLR LOKRB ;CLEAR (FLAG)
CMP @3,R1 ;TEST FOR PC
BNE RET20 ;BR IF NOT
JMP STRC ;RESTART
RET20: DEC CHRCNT ;FINISHED COUNT?
BNE IS ;BR IF NOT
JMP FILE17+2 ;RESTART
IS: MOV @KBOCT,R2 ;LOAD ADDRESS
MOV R1,R3
JSR PC,KBCHR ;LOAD THE OCTAL VALUE
TST DSAVE ;TEST HIGH/LOW BYTE
BNE ECHOB
MOV @R1,(R0)+ ;SAVE BYTE
MOV @R1,(R0) ;SHIFT-IN
COM DSAVE ;COMP FLAG
JMP ECHO ;BR BACK
ECHOB: MOV @R1,(R0)+ ;SAVE CHAR
CLR DSAVE ;CLEAR FLAG
JMP ECHO ;BR BACK
CHRCNT: 200

```

```

1166 ;UPDATE OCTAL READOUT
1167
1168 005332 042703 175000 KBCHR: BIC #175000,R3
1169 005336 004737 005376 JSR PC,108 ;LOAD BITS
1170 005342 110442 MOVB R4,-(R2) ;SAVE BITS
1171 005344 004737 005370 JSR PC,118 ;MOVE BITS
1172 005350 110442 MOVB R4,-(R2) ;SAVE BITS
1173 005352 004737 005370 JSR PC,118 ;MOVE BITS
1174 005356 110442 MOVB R4,-(R2) ;SAVE BITS
1175 005360 004737 005370 JSR PC,118
1176 005364 110442 MOVB R4,-(R2)
1177 005366 000207 RTS PC
1178 005370 006003 118: ROR R3
1179 005372 006003 ROR R3
1180 005374 006003 ROR R3
1181 005376 010304 108: MOV R3,R4 ;LOAD R4
1182 005400 042704 177770 BIC #177770,R4 ;MASK BITS
1183 005404 042704 000060 ADD #60,R4 ;MAKE A NUMBER
1184 005410 000207 RTS PC
1185
1186 005412 012537 005552 MSG: MOV (5)+,COUNT
1187 005416 012537 005554 MOV (5)+,FILE
1188 005422 013777 005554 173424 MSG: MOV FILE,#0PC ;START DISPLAY
1189 005430 005077 173354 MSGA: CLR @PSW
1190 005434 000001 WAIT
1191 005436 005737 002046 TST KR80
1192 005442 001025 BNE MSGAB
1193 005444 005337 005552 MSGAA: DEC COUNT
1194 005450 001405 BEG MSGCB
1195 005452 012777 000001 173374 MSG: MOV #1,#0PC ;SINGLE STEP THE DISPLAY
1196 005460 000137 005430 MSGB: JMP MSGA
1197 005464 000240 MSGCB: NOP
1198 005466 005737 002046 TST KR80
1199 005472 001010 BNE MSGBA
1200 005474 000137 005556 CLR SWITCH
1201 005500 002737 000100 177570 BIT #BIT6,#0DISPLAY
1202 005506 001402 BEQ MSGBA
1203 005510 005137 005556 COM SWITCH
1204 005514 000205 MSGAA: RTS
1205 005516 005737 005556 MSGAB: TST SWITCH
1206 005522 001350 BNE MSGAA
1207 005524 005737 001050 TST CHANGE
1208 005530 001745 BEQ MSGAA
1209 005532 005037 001050 CLR CHANGE
1210 005536 005037 005556 CLR SWITCH
1211 005542 005037 001042 CLR HOLD
1212 005546 000137 001162 JMP SCOPEC
1213 005552 000000 COUNT: 0
1214 005554 000000 FILE: 0
1215 005556 000000 SWITCH: 0

```

1216				
1217	005560	114000		
1218	005562	000000		
1219	005564	001500		
1220	005566	170050		
1221	005570	103124		
1222	005572	017	017	
1223	005574	052107	032055	020060
1224	005562	051117	043440	076524
1225	0055610	051064	053440	021111
1226	0055616	0520110	051126	033461
1227	0055624	053040	051511	040524
1228	0055632	020114	042055	052123
1229	0055640	046474	046474	045504
1230	0055648	042055	042055	043504
1231	0055656	043524	040455	000076
1232	0055664	015	012	012
1233	0055672	040455	020040	044504
1234	0055680	042522	052103	051117
1235	0055688	131		
1236	0055701	015	012	012
1237	0055704	030060	036440	040440
1238	0055712	036440	040440	051111
1239	0055720	041505	047524	054522
1240	0055728	015	012	
1241	0055730	030460	036440	041040
1242	0055736	036440	042040	052117
1243	0055744	051040	050105	040505
1244	0055752	044524	044502	044514
1245	0055760	044524		
1246	0055762	015	012	
1247	0055764	031060	036440	041440
1248	0055772	036440	050040	047111
1249	0055780	052503	044123	047511
1250	0055786	020116	047101	020104
1251	0055794	042526	052103	051117
1252	0055802	041440	051126	040526
1253	0055810	052524	042522	036040
1254	0055818	020130	051117	054440
1255	0055826	047440	043106	042523
1256	0055834	020124	042101	027112
1257	0055842	076		
1258	0055850	015	012	
1259	0055858	060	027763	020075
1260	006070	020104	020075	041517
1261	006076	043524	047507	051516
1262	006104	047440	020122	050523
1263	006112	040525	042522	123
1264	006117	015	012	
1265	006121	060	020064	020075
1266	006126	020105	020075	044103
1267	005134	051101	041501	042524
1268	006142	020122	042523	020124
1269	006150	04474	040510	027122
1270	006156	0440	045104	037056
1271	006164	015	012	

FRMED: POINT

0
MAXY-277
STATSA!ITALO!SYNOFF!GREEN
CHAR!INT4!LPOFF!BLKOFF!LINED
.BYTE 17,17
.ASCIZ /GT-40 OR GT-44 WITH VR17 VISUAL TEST (MD-11-DOGTG-A)/

.BYTE 15,12,12
.ASCII / DIRECTORY/

.BYTE 15,12,12
.ASCII /00 = A = DIRECTORY/

.BYTE 15,12
.ASCII /01 = B = DOT REPEATIBILITY/

.BYTE 15,12
.ASCII /02 = C = PINCUSHION AND VECTOR CURVATURE (X OR Y OFFSET ADJ.)/

.BYTE 15,12
.ASCII /03 = D = OCTAGONS OR SQUARES/

.BYTE 15,12
.ASCII /04 = E = CHARACTER SET (CHAR. ADJ.)/

.BYTE 15,12

E03

GT-40/GT-44 WITH VR17 VISUAL DISPLAY TEST MAINDEC-11-DOG TG-A
DOG GA.P11

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1272	006166	032460	036440	043040
1273	006174	036440	042040	051501
1274	006202	020110	044514	042516
1275	006210	020123	047101	020104
1276	006216	046107	047111	113
1277	006223	015	012	
1278	006225	060	020056	020075
1279	006232	020107	040075	047510
1280	006240	044522	047532	052116
1281	006246	046101	053040	041505
1282	006254	047524	020122	047101
1283	006262	046107	020105	040474
1284	006270	045104	020056	020130
1285	006278	042526	052103	051117
1286	006304	046040	047105	052107
1287	006312	037110		
1288	006314	015	012	
1289	006316	033460	036440	044040
1290	006324	036440	053040	051105
1291	006332	044522	046503	020114
1292	006340	047524	043516	051117
1293	006346	046107	042101	042514
1294	006354	036040	042101	027112
1295	006362	054440	053040	041505
1296	006370	047524	020122	042514
1297	006378	043516	044124	076
1298	006403	015	012	
1299	006405	061	020060	020075
1300	006412	020111	020075	047510
1301	006420	044522	047532	052116
1302	006428	046101	053040	047510
1303	006436	047123	047510	020122
1304	006444	046524	052123	
1305	006446	015	012	
1306	006450	030461	036440	045040
1307	006458	040440	053040	051105
1308	006464	044524	047503	020114
1309	006472	044120	051517	044120
1310	006500	051117	052040	051505
1311	006506	124		
1312	006507	015	012	
1313	006511	020061	020052	020075
1314	006516	020113	020075	047111
1315	006524	042524	051516	052111
1316	006532	020131	042514	042526
1317	006540	020114	047101	020104
1318	006546	044514	044107	026524
1319	006554	042520	020116	042524
1320	006562	052123		
1321	006564	015	012	
1322	006566	031461	036440	046040
1323	006574	036440	042440	043504
1324	006602	020105	046106	043501
1325	006610	052040	051505	124
1326	006615	015	012	
1327	006617	061	020064	020075

.ASCII /05 = F = DASH LINES AND BLINK/

.BYTE 15,12
.ASCII /06 = G = HORIZONTAL VECTOR ANGLE <ADJ. X VECTOR LENGTH>/

.BYTE 15,12
.ASCII /07 = H = VERTICAL VECTOR ANGLE <ADJ. Y VECTOR LENGTH>/

.BYTE 15,12
.ASCII /10 = I = HORIZONTAL PHOSPHOR TEST/

.BYTE 15,12
.ASCII /11 = J = VERTICAL PHOSPHOR TEST/

.BYTE 15,12
.ASCII /12 = K = INTENSITY LEVEL AND LIGHT-PEN TEST/

.BYTE 15,12
.ASCII /13 = L = EDGE FLAG TEST/

.BYTE 15,12
.ASCII /14 = M = SHORT VECTORS AND RELATIVE POINT/

1329	006624	070115	020075	044123
1330	006640	071117	070124	042526
1331	006640	072103	051117	020123
1332	006640	073101	0701104	047522
1333	006640	074114	074517	042116
1334	006672	032461	036440	047040
1335	006700	073440	0713440	047522
1336	006706	074120	075120	052117
1337	006714	052116	051505	124
1338	006721	015	012	
1339	006723	061	070117	020075
1340	006730	070117	070075	044514
1341	006730	074107	07124	042520
1342	006734	073116	077506	046114
1343	006734	073517		
1344	006734	015	012	
1345	006738	07361	076440	050040
1346	006738	07361	073440	074505
1347	006772	077506	051101	070104
1348	007006	071506	047510	052040
1349	007006	051506	124	
1350	007011	015	012	012
1351	007014	07361	07361	047502
1352	007022	07361	07361	020117
1353	007022	07361	07361	047111
1354	007022	07361	07361	044124
1355	007022	07361	07361	052124
1356	007022	07361	07361	
1357	007022	07361	07361	
1358	007022	07361	07361	
1359	007022	07361	07361	
1360	007022	07361	07361	
1361	007022	07361	07361	
1362	007100	07361	07361	
1363	007106	051125	020105	051117
1364	007114	051440	047524	020120
1365	007122	047515	044524	047117
1366	007130	000040		
1367				
1368	007132	173400		
1369	007134	167000		
1370	007136	005560		
1371				
1372	007140			
1373	007140	170052		
1374	007142	116124		
1375	007144	041000		
1376	007146	001000		
1377	007150	040000		
1378	007152	000000		
1379	007154	041000		
1380	007156	001000		
1381	007160	041777		
1382	007162	000000		
1383	007164	041000		

.BYTE 15,12
.ASCII /15 = N = GRAPHLOT TEST/

.BYTE 15,12
.ASCII /16 = 0 = LIGHT PEN FOLLOW/

.BYTE 15,12
.ASCII /17 = P = KEYBOARD ECHO TEST/

.BYTE 15,12,12
.ASCII / RUBOUT TO REMAIN ON THE PATTERN/

.BYTE 15,12
.ASCII / CR TO SELECT SUB-PICTURE OR STOP MOTION /

.EVEN
DSTOP
DJMP
FRMED

FRAME1:
STATSA! ITALO! SYNOFF! GREEN
POINT! INTO! LPOFF! BLKOFF! LINED
INTX+1000
MAXY+1/2
INTX+0
0
INTX+1000
MAXY+1/2
INTX+1777
0
INTX+1000

1384	007166	001000
1385	007170	041777
1386	007172	001777
1387	007174	041000
1388	007176	001000
1389	007200	040000
1390	007202	001777
1391	007204	164000
1392	007206	164000
1393	007210	164000
1394	007212	164000
1395	007214	164000
1396	007216	164000
1397	007218	164000
1398	007222	173400
1399	007224	160000
1400	007226	007140

```

MAXY+1/2
INTX+1777
MAXY
INTX+1000
MAXY+1/2
INTX
MAXY
DNOP
164000
DNOP
164000
DNOP
164000
DNOP
164000
DNOP
164000
DNOP
164000
DNOP
164000
DNOP
164000
DSTOP
DJMP
FRAME1

```

;FILE 2 <ANALOG TUNE-UP TEST >

1401		
1402		
1403		
1404	007230	116524
1405	007232	000000
1406	007234	000000
1407	007236	170052
1408	007240	110000
1409	007242	041777
1410	007244	000000
1411	007246	040000
1412	007250	001777
1413	007252	061777
1414	007254	000000
1415	007256	040000
1416	007260	021777
1417	007262	041777
1418	007264	020000
1419	007266	060000
1420	007270	001777
1421	007272	061777
1422	007274	020000
1423	007276	060000
1424	007300	021777
1425	007302	041777
1426	007304	001777
1427	007306	061777
1428	007310	021777
1429	007312	001777
1430	007314	000000
1431	007316	061777
1432	007320	001777
1433	007322	041777
1434	007324	021777
1435	007326	173400
1436	007330	160000
1437	007332	007230
1438		
1439		

```

FRAME2: POINT!INT2!LPOFF!BLKOFF!LINE0
0
0
STATSA!ITALO!SYNOFF!GREEN
LONGV
INTX!MAXX ; +X, +Y
0
INTY ; +X, +Y
MAXY
INTX!MINUSX!MAXX ; -X, +Y
0
INTX ; +X, -Y
MINUSY!MAXY
INTX!MAXX ; +X, -Y
MINUSY
INTX!MINUSX ; -X, +Y
MAXY
INTX!MINUSX!MAXX ; -X, -Y
MINUSY
INTX!MINUSX ; -X, -Y
MAXY
INTX!MAXX
MINUSY!MAXY
INTX!MINUSX!MAXX
0
INTX!MINUSX!MAXX
MAXY
INTX!MAXX
MINUSX!MAXY
DSTOP
DJMP
FRAME2

```

;OCTAGONS

1440
1441
1442
1443
1444
1445
1446
1447
1448
1449
1450
1451
1452
1453
1454
1455
1456
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1460
1461
1462
1463
1464
1465
1466
1467
1468
1469
1470
1471
1472
1473
1474
1475
1476
1477
1478
1479
1480
1481
1482
1483
1484
1485
1486
1487
1488
1489
1490
1491
1492
1493
1494
1495

FRME3: POINT!INT4!LP OFF!BLKOFF!LINED
774
564
STATSA!ITALD!SYNOFF!GREEN
LONGV
INTX+7
0
INTX+7
INTX
INTX!MINUSX+7
INTX!MINUSX+7
0
INTX!MINUSX+7
MINUSX+7
INTX
MINUSX+7
INTX+7
MINUSX+7
POINT
770
55C
LOF 2V
INTX+17
0
INTX+17
17
INTX
17
INTX!MINUSX+17
17
INTX!MINUSX+17
0
INTX!MINUSX+17
MINUSX+17
INTX
MINUSX+17
INTX+17
MINUSX+17
POINT
760
520
LONGV
INTX+37
0
INTX+37
37
INTX
37
INTX!MINUSX+37
37
INTX!MINUSX+37
0

;OCTOGON BY LENGTH OF 7

;OCTOGON BY LENGTH OF 17

;OCTOGON BY LENGTH OF 37

1496	007512	060037	INTX!MINUSX+37
1497	007514	020037	MINUSX+37
1498	007516	020037	INTX
1499	007518	020037	MINUSX+37
1500	007520	040037	INTX+37
1501	007522	020037	MINUSX+37
1502	007524	114000	POINT
1503	007526	000740	740
1504	007528	000440	440
1505	007530	110000	LONGV
1506	007532	040077	INTX+77
1507	007534	020077	0
1508	007536	020077	INTX+77
1509	007538	000077	77
1510	007540	0400300	INTX
1511	007542	000077	77
1512	007544	020077	INTX!MINUSX+77
1513	007546	020077	77
1514	007548	060077	INTX!MINUSX+77
1515	007550	000000	0
1516	007552	020077	INTX!MINUSX+77
1517	007554	020077	MINUSX+77
1518	007556	040000	INTX
1519	007558	020077	MINUSX+77
1520	007560	040077	INTX+77
1521	007562	020077	MINUSX+77
1522	007564	114000	POINT
1523	007600	000700	700
1524	007602	000300	300
1525	007604	110000	LONGV
1526	007606	040177	INTX+177
1527	007610	000000	0
1528	007612	040177	INTX+177
1529	007614	000177	177
1530	007616	040000	INTX
1531	007620	000177	177
1532	007622	060177	INTX!MINUSX+177
1533	007624	000177	177
1534	007626	020177	INTX!MINUSX+177
1535	007630	020000	0
1536	007632	020177	INTX!MINUSX+177
1537	007634	020177	MINUSX+177
1538	007636	040000	INTX
1539	007640	020177	MINUSX+177
1540	007642	040177	INTX+177
1541	007644	020177	MINUSX+177
1542	007646	114000	POINT
1543	007650	000600	600
1544	007652	000000	0
1545	007654	110000	LONGV
1546	007656	040377	INTX+377
1547	007660	000000	0
1548	007662	020377	INTX+377
1549	007664	020377	377
1550	007666	040000	INTX
1551	007670	000377	377

;OCTOGON BY LENGTH OF 77

;OCTOGON BY LENGTH OF 177

;OCTOGON BY LENGTH OF 377

1552 007672 060377
1553 007674 001377
1554 007676 060377
1555 007700 000000
1556 007702 060377
1557 007704 001377
1558 007706 040000
1559 007710 020377
1560 007712 040377
1561 007714 020377
1562 007716 173400
1563 007720 160000
1564 007722 007334
1565
1566
1567 007724 117124
1568 007726 001000
1569 007730 000600
1570 007732 170052
1571
1572
1573 007734 110000
1574 007736 040007
1575 007740 000000
1576 007742 040000
1577 007744 000007
1578 007746 060007
1579 007750 000000
1580 007752 040000
1581 007754 020007
1582 007756 001004
1583 007760 020004
1584
1585 007762 110000
1586 007764 040017
1587 007766 000000
1588 007770 040000
1589 007772 000017
1590 007774 060017
1591 007776 000000
1592 010000 040000
1593 010002 020017
1594 010004 020007
1595 010006 020007
1596
1597 010010 110000
1598 010012 040037
1599 010014 000000
1600 010016 040000
1601 010020 000037
1602 010022 060037
1603 010024 000000
1604 010026 040000
1605 010030 020037
1606 010032 020017
1607 010034 020017

INTX!MINUSX+377
377
INTX!MINUSX+377
0
INTX!MINUSX+377
MINUSX+377
INTX
MINUSX+377
INTX+377
MINUSX+377
DSTOP
DUMP
FRAME3
; SQUARES 7,17,37,77,177,377,777 WIDE
FRAME3A: POINT!INT4!LPOFF!BLKOFF!LINED ; BY 7
1000
600
STATSA!ITALD!SYNOFF!GREEN
Q=7
R=4
LONGV ; BY 7 AND 4
INTX+7
0
INTX
7
INTX!MINUSX+7
0
INTX
MINUSX+7
MINUSX+4
MINUSX+4
.LIST
LONGV ; BY 17 AND 7
INTX+17
0
INTX
17
INTX!MINUSX+17
0
INTX
MINUSX+17
MINUSX+7
MINUSX+7
.LIST
LONGV ; BY 37 AND 17
INTX+37
0
INTX
37
INTX!MINUSX+37
0
INTX
MINUSX+37
MINUSX+17
MINUSX+17

1608			.LIST	
1609	010036	110000	LONGV	;BY 77 AND 37
1610	010040	040077	INTX+77	
1611	010042	000000	0	
1612	010044	040000	INTX	
1613	010046	000077	77	
1614	010050	060077	INTX!MINUSX+77	
1615	010052	000000	0	
1616	010054	040000	INTX	
1617	010056	020077	MINUSX+77	
1618	010060	0 037	MINUSX+37	
1619	010062	0 037	MINUSX+37	
1620			.LIST	
1621	010064	110000	LONGV	;BY 177 AND 77
1622	010066	040177	INTX+177	
1623	010070	000000	0	
1624	010072	040000	INTX	
1625	010074	000177	177	
1626	010076	060177	INTX!MINUSX+177	
1627	010100	000000	0	
1628	010102	040000	INTX	
1629	010104	020177	MINUSX+177	
1630	010106	0 077	MINUSX+77	
1631	010110	020077	MINUSX+77	
1632			.LIST	
1633	010112	110000	LONGV	;BY 377 AND 177
1634	010114	040377	INTX+377	
1635	010116	000000	0	
1636	010120	040000	INTX	
1637	010122	000377	377	
1638	010124	060377	INTX!MINUSX+377	
1639	010126	000000	0	
1640	010130	040000	INTX	
1641	010132	020377	MINUSX+377	
1642	010134	020177	MINUSX+177	
1643	010136	020177	MINUSX+177	
1644			.LIST	
1645	010140	110000	LONGV	;BY 777 AND 377
1646	010142	040777	INTX+777	
1647	010144	000000	0	
1648	010146	040000	INTX	
1649	010150	000777	777	
1650	010152	060777	INTX!MINUSX+777	
1651	010154	000000	0	
1652	010156	040000	INTX	
1653	010160	020777	MINUSX+777	
1654	010162	020377	MINUSX+377	
1655	010164	020377	MINUSX+377	
1656			.LIST	
1657	010166	173400	DSTOP	
1658	010170	160000	DJMP	
1659	010172	007724	FRME3A	
1660				
1661				
1662				
1663	010174	117000		

;DASH LINE TEST

FRME5: POINT!INT4

1664	010176	000000				0
1665	010200	001000				1000
1666	010202	174400				STATSB!SIZED
1667	010204	170052				STATSA!ITALD!SYNOFF!GREEN
1668	010206	100004				CHAR!LINE0
1669	010210	017	017			.BYTE 17,17
1670	010212	047523	044514	020104		.ASCII /SOLID /
1671	010220	020040	020040			
1672	010224	110004				LONGV!LINE0
1673	010226	040400				40400
1674	010230	000000				0
1675	010232	000400				400
1676	010234	000000				0
1677	010236	110330				LONGV!BLKON
1678	010240	040400				40400
1679	010242	000000				0
1680	010244	100020				CHAR!BLKOFF
1681	010246	015	012	012		.BYTE 15,12,12,12,12,12
1682	010251	012	012	012		
1683	010254	040504	044123	044440		.ASCII /DASH I /
1684	010252	020040	020040			
1685	010256	110305				LONGV!LINE1
1686	010270	040400				40400
1687	010272	000000				0
1688	010274	000400				400
1689	010276	000000				0
1690	010300	110330				LONGV!BLKON
1691	010302	040400				40400
1692	010304	000000				0
1693	010306	100020				CHAR!BLKOFF
1694	010310	015	012	012		.BYTE 15,12,12,12,12,12
1695	010313	012	012	012		
1696	010316	040504	044123	044440		.ASCII /DASH II /
1697	010324	020111	020040			
1698	010330	110006				LONGV!LINE2
1699	010332	040400				40400
1700	010334	000000				0
1701	010336	000400				400
1702	010340	000000				0
1703	010342	110030				LONGV!BLKON
1704	010344	040400				40400
1705	010346	000000				0
1706	010350	100020				CHAR!BLKOFF
1707	010352	015	012	012		.BYTE 15,12,12,12,12,12
1708	010355	012	012	012		
1709	010360	040504	044123	044440		.ASCII /DASH III /
1710	010366	044511	020040			
1711	010372	110007				LONGV!LINE3
1712	010374	040400				40400
1713	010376	000000				0
1714	010400	000400				400
1715	010402	000000				0
1716	010404	110030				LONGV!BLKON
1717	010406	040400				40400
1718	010410	000000				0
1719	010412	110024				LONGV!BLKOFF!LINE0

```

1720 010414 000000
1721 010416 000000
1722 010420 173400
1723 010422 160000
1724 010424 010174
1725
1726
1727
1728 010426 114000
1729 010430 001777
1730 010432 000000
1731 010434 170052
1732 010436 113724
1733 010438 040000
1734 010442 001777
1735 010444 114000
1736 010446 000000
1737 010450 001777
1738 010452 110000
1739 010454 041777
1740 010456 000000
1741 010460 173400
1742 010462 114000
1743 010464 000000
1744 010466 000000
1745 010470 110000
1746 010472 000000
1747 010474 000000
1748 010476 173400
1749 010500 160000
1750 010502 010462
1751
1752
1753
1754
1755 010504 114000
1756 010506 000000
1757 010510 000000
1758 010512 170052
1759 010514 113724
1760 010516 040000
1761 010520 001777
1762 010522 000002
1763 010524 000000
1764 010526 040000
1765 010530 021777
1766 010532 000002
1767 010534 000000
1768 010536 173400
1769 010540 160000
1770 010542 010514
1771
1772
1773
1774 010544 114000
1775 010546 000000

```

```

0
0
DSTOP
DJMP
FRME5
;VECTOR LENGTH TEST <FILE 6 AND 7>
FRME6: POINT
MAXX
0
STATSA!ITALO!SYNOFF!GREEN
LONGV!INT7!LPOFF!BLKOFF!LINEO
INTX
MAXY
POINT
0
MAXY
LONGV
INTX!MAXX
0
DSTOP
FRME6A: POINT
0
0
LONGV
DELTX6: 0
DELT6: 0
DSTOP
DJMP
FRME6A
;PHOSPHOR TEST
FRME10: POINT
DELT7: 0
0
STATSA!ITALO!SYNOFF!GREEN
DFI10A: LONGV!INT7!LPOFF!BLKOFF!LINEO
INTX
MAXY
2
0
INTX
MINUSY!MAXY
2
0
DSTOP
DJMP
DFI10A
;PHOSPHOR TEST
FRME11: POINT
0

```

1776 010550 000000
 1777 010552 170052
 1778 010554 113724
 1779 010556 041777
 1780 010558 000000
 1781 010562 000000
 1782 010564 000002
 1783 010566 061777
 1784 010570 000000
 1785 010572 000000
 1786 010574 000002
 1787 010576 173400
 1788 010600 160000
 1789 010602 010554
 1790
 1791 010604 117604
 1792 010606 000000
 1793 010610 000000
 1794 010612 110000
 1795 010614 041777
 1796 010616 000000
 1797 010620 040000
 1798 010622 001777
 1799 010624 061777
 1800 010626 000000
 1801 010630 040000
 1802 010632 021777
 1803 010634 173400
 1804 010636 160000
 1805 010640 010604
 1806
 1807
 1808
 1809 010642 114164
 1810 010644 000000
 1811 010646 001200
 1812 010650 170252
 1813 010652 103600
 1814 010654 017
 1815 010656 047111
 1816 010664 052111
 1817 010672 020040
 1818 010674 110000
 1819 010676 041000
 1820 010700 000000
 1821 010702 130000
 1822 010704 057600
 1823 010706 103400
 1824 010710 015
 1825 010713 012
 1826 010714 047111
 1827 010722 052111
 1828 010730 020040
 1829 010732 110000
 1830 010734 041000
 1831 010736 000000

017 017
 042524 051516
 020131 020067

 012 012
 042524 051516
 020131 020066

DELTY7: 0
 STATSA!ITALO!SYNOFF!GREEN
 DFI11C: LONGV!INT7!LPOFF!BLKOFF!LINEO
 INTX!MAXX
 0
 0
 2
 INTX!MINUSX!MAXX
 0
 0
 2
 DSTOP
 DJMP
 DFI11C
 FRM10: POINT!INT7!LINEO
 0
 0
 LONGV
 INTX!MAXX
 0
 INTX
 MAXY
 INTX!MINUSX!MAXX
 0
 INTX
 MINUSX!MAXY
 DSTOP
 DJMP
 FRM10

 ;INTENSITY TEST
 FRME12: POINT!LINEO!LPON!BLKOFF
 0
 1200
 SYN12: STATSA!LPLITE!SYNOFF!ITALO!GREEN
 CHAR!INT7
 .BYTE 17,17
 .ASCII /INTENSITY 7 /

 LONGV
 41000
 0
 RELATV
 57600
 CHAR!INT6
 .BYTE 15,12,12,12
 .ASCII /INTENSITY 6 /

 LONGV
 41000
 0

1832	010740	130000			RELATV
1833	010742	057600			57600
1834	010744	103200			CHAR!INT5
1835	010746	015	012	012	.BYTE 15,12,12,12
1836	010751	012			
1837	010752	047111	042524	051516	.ASCII /INTENSITY 5 /
1838	010760	052111	020131	020065	
1839	010766	020040			
1840	010770	110000			LONGV
1841	010772	041000			41000
1842	010774	000000			0
1843	010776	130000			RELATV
1844	011000	057600			57600
1845	011002	103000			CHAR!INT4
1846	011004	015	012	012	.BYTE 15,12,12,12
1847	011007	012			
1848	011010	047111	042524	051516	.ASCII /INTENSITY 4 /
1849	011016	052111	020131	020064	
1850	011024	020040			
1851	011026	110000			LONGV
1852	011030	041000			41000
1853	011032	000000			0
1854	011034	130000			RELATV
1855	011036	057600			57600
1856	011040	102600			CHAR!INT3
1857	011042	015	012	012	.BYTE 15,12,12,12
1858	011045	012			
1859	011046	047111	042524	051516	.ASCII /INTENSITY 3 /
1860	011054	052111	020131	020063	
1861	011062	020040			
1862	011064	110000			LONGV
1863	011066	041000			41000
1864	011070	000000			0
1865	011072	130000			RELATV
1866	011074	057600			57600
1867	011076	102400			CHAR!INT2
1868	011100	015	012	012	.BYTE 15,12,12,12
1869	011103	012			
1870	011104	047111	042524	051516	.ASCII /INTENSITY 2 /
1871	011112	052111	020131	020062	
1872	011120	020040			
1873	011122	110000			LONGV
1874	011124	041000			41000
1875	011126	000000			0
1876	011130	130000			RELATV
1877	011132	057600			57600
1878	011134	102200			CHAR!INT1
1879	011136	015	012	012	.BYTE 15,12,12,12
1880	011141	012			
1881	011142	047111	042524	051516	.ASCII /INTENSITY 1 /
1882	011150	052111	020131	020061	
1883	011156	020040			
1884	011160	110000			LONGV
1885	011162	041000			41000
1886	011164	000000			0
1887	011166	130000			RELATV

1888 011170 057600
 1889 011172 102000
 1890 011174 015
 1891 011177 012
 1892 011200 047111
 1893 011206 052111
 1894 011214 020040
 1895 011216 110000
 1896 011220 041000
 1897 011222 000000
 1898 011224 130000
 1899 011226 057600
 1900 011230 164 00
 1901 011232 164 00
 1902 011234 164 00
 1903 011236 164 00
 1904 011238 164 00
 1905 011240 164 00
 1906 011242 164 00
 1907 011244 164000
 1908 011246 164000
 1909 011248 173400
 1910 011250 164000
 1911 011252 164000
 1912 011254 117100
 1913 011256 001500
 1914 011258 001200
 1915 011260 100000
 1916 011262 044514
 1917 011264 042520
 1918 011302 000124
 1919
 1920 011304 173400
 1921 011306 160000
 1922 011310 010642
 1923
 1924
 1925
 1926 011312 117124
 1927 011314 000000
 1928 011316 000000
 1929 011320 170052
 1930 011322 100000
 1931 011324 017
 1932 011326 110000
 1933 011330 041777
 1934 011332 000000
 1935 011334 040000
 1936 011336 001777
 1937 011340 061777
 1938 011342 000000
 1939 011344 040000
 1940 011346 021777
 1941 011350 114000
 1942 011352 000100
 1943 011354 000300

012 012
 042524 051516
 020131 020060

044107 020124
 020116 044510

017

57600
 CHAR!INTO
 .BYTE 15,12,12,12
 .ASCII /INTENSITY 0 /

LONGV
 41000
 0
 RELATV
 57600
 DNOP
 DNOP
 DNOP
 DNOP
 DNOP
 DNOP
 DNOP
 DNOP
 RAYLPA: DSTOP
 DNOP
 DNOP

RAYLPA: DSTOP

DFI12A: POINT!INT4!LPOFF
 1500
 LPPNT: 1200
 CHAR
 .ASCIZ /LIGHT PEN HIT/

.EVEN
 DSTOP
 DJMP
 FRME12

;EDGE FILE
 FRME13: POINT!INT4!LPOFF!BLKOFF!LINE0

0
 0
 STATSA!ITALO!SYNOFF!GREEN
 CHAR
 .BYTE 17,17
 LONGV
 INTX!MAXX
 0
 INTX
 MAXY
 INTX!MINUSX!MAXX
 0
 INTX
 MINUSY!MAXY
 POINT
 100
 300

;LEFT SIDE

1944 011356 110000
 1945 011360 040000
 1946 011362 000400
 1947 011364 060200
 1948 011366 000000
 1949 011370 040000
 1950 011372 020400
 1951 011374 040200
 1952 011376 000000
 1953 011400 114000
 1954 011402 000200
 1955 011404 001700
 1956 011406 110000
 1957 011410 040400
 1958 011412 000000
 1959 011414 040000
 1960 011416 000200
 1961 011420 040000
 1962 011422 000000
 1963 011424 040000
 1964 011426 020200
 1965 011430 114000
 1966 011432 001700
 1967 011434 001500
 1968 011436 110000
 1969 011440 040000
 1970 011442 020400
 1971 011444 040200
 1972 011446 000000
 1973 011450 040000
 1974 011452 000400
 1975 011454 060200
 1976 011456 000000
 1977 011460 114000
 1978 011462 001600
 1979 011464 000100
 1980 011466 110000
 1981 011470 060400
 1982 011472 000000
 1983 011474 040000
 1984 011476 020200
 1985 011500 040400
 1986 011502 000000
 1987 011504 040000
 1988 011506 000200
 1989 011510 114000
 1990 011512 001777
 1991 011514 000400
 1992 011516 110000
 1993 011520 000020
 1994 011522 000000
 1995 011524 100000
 1996 011526 015
 1997 011530 114000
 1998 011532 000000
 1999 011534 000500

LONGV
 INTX
 400
 INTX!MINUSX+200
 0
 INTX
 MINUSY+400
 INTX+200
 0
 POINT
 200
 MAXY+1-100
 LONGV
 INTX+400
 0
 INTX
 200
 INTX!MINUSX+400
 0
 INTX
 MINUSY+200
 POINT
 1700
 MAXY+1-300
 LONGV
 INTX
 MINUSY+400
 INTX+200
 0
 INTX
 400
 INTX!MINUSX+200
 0
 POINT
 1600
 100
 LONGV
 INTX!MINUSX+400
 0
 INTX
 MINUSY+200
 INTX+400
 0
 INTX
 200
 POINT
 MAXX
 400
 LONGV
 20
 0
 CHAR
 .BYTE 15,101
 POINT
 0
 500

;TOP SIDE

;RIGHT SIDE

;BOTTOM SIDE

2000	011536	110000		LONGV		
2001	011540	020012		MINUSX+12		
2002	011542	0C0000		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						

2013
2014
2015 011566 170052
2016 011570 117124
2017 011572 000000
2018 011574 000000
2019 011576 104000
2020 011600 056200
2021 011602 0 271
2022 011604 040071
2023 011606 076271
2024 011610 076200
2025 011612 076371
2026 011614 040171
2027 011616 056371
2028 011620 020504
2029 011622 164000
2030 011624 164000
2031 011626 130000
2032 011630 057000
2033 011632 057074
2034 011634 040074
2035 011636 077074
2036 011640 077000
2037 011642 077174
2038 011644 040174
2039 011646 057174
2040 011650 020504
2041 011652 164000
2042 011654 164000
2043 011656 104000
2044 011660 057600
2045 011662 057677
2046 011664 040077
2047 011665 077677
2048 011670 077600
2049 011672 077777
2050 011674 040177
2051 011676 057777
2052 011700 020504
2053 011702 164000
2054 011704 164000
2055 011706 173400
2056 011710 160000
2057 011712 011566

FRME14: STATSA!ITALO!SYNOFF!GREEN
POINT!INT4!BLKOFF!LPOFF!LINEO
FRM14A: 0
FRM14B: 0
SHORTV
INTX+16200
INTX+16200+71
INTX+71
INTX!MINUSX+16200+71
INTX!MINUSX+16200
INTX!MINUSX+16200+MINSUY+71
INTX+MINSUY+71
INTX+16200+MINSUY+71
20504
DNOP
DNOP
RELATV
INTX+17000
INTX+17000+74
INTX+74
INTX!MINUSX+17000+74
INTX!MINUSX+17000
INTX!MINUSX+17000+MINSUY+74
INTX+MINSUY+74
INTX+17000+MINSUY+74
20504
DNOP
DNOP
SHORTV
INTX+17600
INTX+17600+77
INTX+77
INTX!MINUSX+17600+77
INTX!MINUSX+17600
INTX!MINUSX+17600+MINSUY+77
INTX+MINSUY+77
INTX+17600+MINSUY+77
20504
DNOP
DNOP
DSTOP
DJMP
FRME14


```

2114 012120 164000
2115 012120 164000
2116 012121 130700
2117 012120 034700
2118 012120 040160
2119 012120 040000
2120 012120 040000
2121 012120 040000
2122 012120 040000
2123 012120 040000
2124 012120 040000
2125 012120 040000
2126 012120 040000
2127 012120 040000
2128 012120 040000
2129 012120 040000
2130 012120 040000
2131 012120 040000
2132 012120 040000
2133 012120 040000
2134 012120 040000
2135 012120 040000
2136 012120 040000
2137 012120 040000
2138 012200 040000
2139 012200 040000
2140 012200 040000
2141 012200 040000
2142 012200 040000
2143 012200 040000
2144 012200 040000
2145 012200 040000
2146 012200 040000
2147 012200 040000
2148 012200 040000
2149 012200 040000
2150 012200 110000
2151 012200 000000
2152 012200 000077
2153 012240 040160
2154 012242 020160
2155 012244 060160
2156 012246 020160
2157 012250 060160
2158 012252 000160
2159 012254 040160
2160 012256 000160
2161 012260 164000
2162 012265 164000
2163 012265 164000
2164 012266 164000
2165 012270 164000
2166 012272 164000
2167 012274 173400
2168 012276 160000
2169 012276 160000

```

```

DNOP
DNOP
RELATV
MINUSX+14000
TAB16B: INTX!MINUSY+60
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
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INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
INTX+4
DNOP
DNOP
DNOP
DNOP
DNOP
DNOP
DNOP
DNOP
DNOP
DNOP
DNOP
DNOP
DNOP
LONGV
0
77
PNT16A: INTX+160
MINUSX+160
PNT16B: INTX!MINUSX+160
MINUSX+160
PNT16C: INTX!MINUSX+160
160
PNT16D: INTX+160
160
DNOP
DNOP
DNOP
DNOP
DNOP
DNOP
DSTOP
DJMP

```

```

2170 012300 011714
2171
2172 012302 117724
2173 012304 000000
2174 012306 001600
2175 012310 170052
2176 012312 100000
2177 012314 017 017
2178 012316 044514 044107 020124
2179 012324 042520 020116 044506
2180 012332 046105 0 0104 043117
2181 012340 053140 042511 020127
2182 012346 015 012 012
2183 012351 116 046525 042502
2184 012356 020122 043117 044000
2185 012354 0 0111 0 0123 020075
2186 012372 0 0 030060
2187 012376 173 00
2188 012400 160 00
2189 012402 012302
2190
2191 012404 114124
2192 012406 000000
2193 012410 001600
2194 012412 170 52
2195 012414 103000
2196 012416 017 017
2197 012420 042513 041131 040517
2198 012426 042122 042440 044103
2199 012434 020117 042524 052123
2200 012442 000
2201 012443 015 012 012
2202 012446 044103 051101 047440
2203 012454 052103 036440 040
2204 012461 000 000 000
2205 012464 000
2206 012465 015 012 012 KBOCT: .BYTE 15,12,12
2207
2208 012470 164000 BUFFER: DNOP
2209
2210 000001 .END

```

FRAME16

```

FRM16A: POINT!INT7!LPOFF!BLKOFF!LINED
0
MAXY-177
STATSA!ITALO!SYNOFF!GREEN
CHAR
.BYTE 17,17
.ASCII /LIGHT PEN FIELD OF VIEW /

.BYTE 15,12,12
.ASCII /NUMBER OF HITS = 0000/

```

```

FRM16B: DSTOP
DJMP
FRM16A

```

FRAME17: POINT!LPOFF!BLKOFF!LINED

;MUST BE JUST BEFORE THE BUFFER

```

0
MAXY-177
STATSA!ITALO!SYNOFF!GREEN
CHAR!INT4
.BYTE 17,17
.ASCIIZ /KEYBOARD ECHO TEST/

.BYTE 15,12,12
.ASCII /CHAR OCT = /

.BYTE 0,0,0,0

KBOCT: .BYTE 15,12,12

BUFFER: DNOP

.END

```


D7F	003434	862#						
ECHOA	005060	1119#	1121					
ECHOB	005316	1155#	1160#					
ECHOC	005166	1133#	1138	1159	1162			
FILE	005554	1187*	1183	1214#				
FILE0	002050	460	534	595#	998			
FILE1	002362	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	004752	475	1117#	1150				
FILE2	002074	462	609#					
FILE2A	002274	638	646#					
FILE 8	002302	647#	658					
FILE2C	002222	648	654#					
FILE2D	002222	652	657#					
FILE3	002222	463	662#					
FILE3A	002222	664#	670	677				
FILE3B	002222	665	673#					
FILE4	002414	464	671	683#				
FILE4A	002746	707	754#					
FILE5	003024	465	767	773#				
FILE6	003036	466	780#					
FILE7	003170	467	807#					
FILLA	002716	740#	743					
FILLIT	002712	723	727	739#				
FIL14A	003734	915	924#					
FLE12A	003476	873#	884					
FLE12B	003514	874	877#					
FLE12C	003522	876	878#					
FLE12D	003606	882	891#					
FR 10	005560	598	1217#	1370				
FRME1	007140	605	1372#	1400				
FRME10	010504	838	1755#					
FRME11	010544	855	1774#					
FRME12	010642	880	1809#	1922				
FRME13	011312	899	1926#	2011				
FRME14	011566	929	934	939	944	2015#	2057	
FRME16	011714	1027	2059#	2170				
FRME17	012404	1135	2191#					
FRME2	007230	656	1404#	1437				
FRME3	007274	668	1441#	1564				
FRME3A	007724	675	1567#	1659				
FR 5	010174	776	1663#	1724				
FR 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#	2169				
FRM16B	012376	1019*	1020*	1072	2187#			
GRAPHX=	120000	592#	963					

LOADSP	002564	700	703	709#										
LOADUP	004556	1014	1054#											
LOADVT	003705	909	911	917#										
LOGICA	004316	993#												
LOKR8	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				
LOCPA	003062	784#	800	803										
LOCPA1	003070	785#	797											
LOCPA2	003114	790#	795											
LOCPA3	003140	796#												
LOOP8	003214	811#	827	830										
LOOP81	003222	812#	824											
LOOP82	003246	817#	822											
LOOP83	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#										
MINUSY=	000100	592#	2025	2026	2027	2037	2038	2039	2049	2050	2051	2118		
MINUSX=	020003	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*

SP =x000006	371#	454#	479#	480#	481#	482#	483#	484#	485	491#	492	493	494
SPACE 002730	495	496	497	499#	508#	888	1085						
START 001356	701	724	746#										
STATSA= 170000	390	508#											
	592#	686	699	702	721	725	961	1220	1373	1407	1444	1570	1667
STATSB= 174000	1731	1758	1777	1812	1929	2015	2062	2175	2194				
STCHAR 002666	592#	686#	962	983	985	1666							
STKPTR= 000500	693#	695#	697#	722	726	731#							
STRA 001400	374#	454	499	508									
STRB 001424	512#	515											
STRC 001456	518#	521											
SWITCH 005556	526#	1147											
	439#	442#	522#	566#	573#	584#	647	664	799	826	843	860	873
SYNOFF= 000010	976	1022	1068	1200#	1203#	1205	1210#	1215#					
	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#									
THEVT1 001076	433#	550	551#										
TSAYE 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	5938	1220	1372	1407	1444	1570	1731	1758	1777	1929	2062	2175	2194
DSTEP	4188	889	1093	1195									
OCTGN	20148	2020	2032	2074									
OCTGON	14458	1465	1485	1505	1525	1545							
SQUARE	15718	1573	1585	1597	1609	1621	1633	1645					

ADD	513	519	793	820	845	862	967	982	1099	1108	1183							
AND	453																	
ANDI	1097	1097	1105	1106														
ANDI	441	541	565	648	715	882	977	990	1069	1098	1107	1194	1202	1208				
BIC	450	538	563	875	887	975	1065	1067	1111	1140	1168	1182						
BIS	445	877	978	1130														
BIT	445	443	540	1201														
BMI	555	568	570															
BNE	428	441	446	515	521	577	618	630	658	665	670	677	717	743	749			
	766	795	797	810	803	822	824	827	830	844	847	861	864	874	921			
	949	970	974	937	1023	1040	1043	1051	1060	1101	1110	1121	1137	1146	1149			
	1155	1188	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	1032	1093	1122	1123	1144	1161	1189	1200	1209	1210	1211						
COMP	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					
EXT	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	470	481	482	483	484	485	486	491	492	493	494	495			
	486	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			
	621	622	623	624	625	626	637	640	641	642	643	646	663	664	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	899	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								
MOV8	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			

E05

GT-40/GT-44 WITH VR17 VISUAL DISPLAY TEST MAINDEC-11-DOGTG-A
DOGTGA.P11 CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

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	2065	2070	2071	2073	2074	2178	2183	2202							
.ASCIZ	1223	1359	1916	2197											
.BYTE	1223	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			
.REN	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)

