

GT40-41-42-44

VISUAL DISPLAY TEST
MD-11-DDGTG-A

EP DDGTG A-DL A

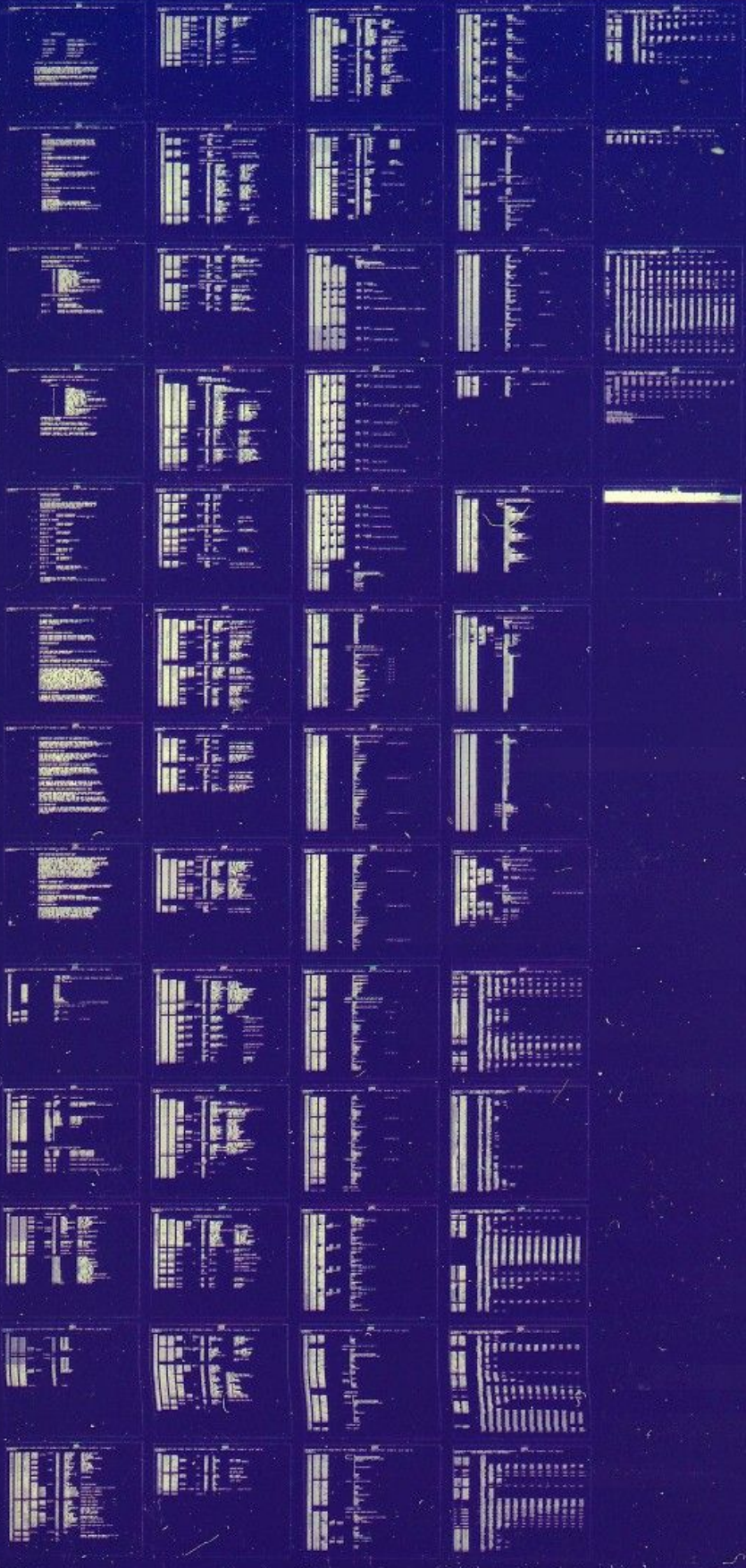
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IDENTIFICATION

PRODUCT CODE:	MAINDEC-11-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 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 REPEATIBILITY
02 /PIN CUSHION (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 /GRAPH PLOT INCREMENT TEST

OPERATOR INTERVENTION TESTS

16 /LIGHT-PEN FOLLOW TEST
17 /KEYBOARD ECHO
SW 6 = 0 SELECT SUB-PICTURE 0
SW 6 = 1 SELECT SUB-PICTURE 1 OR
STOP DISPLAY FRAME MOTION
SW 8 = 0 EXECUTE ALL NON-OPERATOR INTERVENTION FRAMES.
SW 8 = 1 EXECUTE THE DISPLAY FRAME SPECIFIED BY SW 0-3.

4.3 CONTROL SWITCH SETTINGS (DISPLAY KEYBOARD)

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

CHARACTER	TEST
A	DIRECTORY
B	DOT REPEATIBILITY
C	PINCUSHION (X AND Y OFFSET ADJ.)
D	OCTAGONS OR SQUARES
E	CHARACTER SET (CHAR. ADJ.)
F	DASH LINES AND BLINK
G	VECTOR LENGTH TEST (X VECTOR LENGTH ADJ.)
H	VECTOR LENGTH TEST (Y VECTOR LENGTH ADJ.)
I	PHOSPHOR TEST (HORIZ)
J	PHOSPHOR TEST (VERT)
K	INTENSITY LEVELS, SYNC AND LIGHT-PEN TEST
L	EDGE TEST
M	SHORT VECTOR AND RELATIVE POINT
N	GRAPHLOT 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 THEN RETURNS IN THE OPPOSITE DIRECTION. A SIMILAR SEQUENCE IS REPEATED STARTING AT LOWER RIGHT CORNER TO THE UPPER LEFT CORNER AND BACK. THE PURPOSE IS TO MAKE CERTAIN THAT THE VECTORS ARE LINEAR OVER THEIR ENTIRE LENGTH. WITH PROPER LENGTH VECTORS ONLY TWO DIAGONAL LINES SHOULD BE SEEN IN THE CENTER OF THE SCREEN. DO NOT ADJUST THE VECTOR LENGTH POTS WITH THIS DISPLAY PATTERN. SINGLE LINES SHOULD BE VISABLE AT THE TOP AND BOTTOM OF THE SCREEN. IF NOT ADJUST THE Y OFFSET POT. SINGLE LINES SHOULD BE VISABLE AT THE RIGHT AND LEFT EDGE OF THE SCREEN IF NOT ADJUST THE X OFFSET POT..

9.4 OCTAGONS OR SQUARES

A SERIES OF DIFFERENT SIZE OCTAGONS OR SQUARES ARE DRAWN TO DEMONSTRATE THAT CLOSED FIGURES CAN BE 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 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 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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359
360
361
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365 000000
366 000001
367 000002
368 000003
369 000004
370 000005
371 000006
372 000007
373 104000
374 000500
375 177570
376
377
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380 000024
381 000024 001250
382 000026 000340
383
384 000030
385 000030 001100
386 000032 000340
387

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.ENABL ABS,AMA
.TITLE GT-40/GT-44 WITH VR17 VISUAL DISPLAY TEST MAINDEC-11-DDGTG-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      PSM:   177776
001012 177560      TKS:   177560
001014 177562      TKB:   177562
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 012500      DBUF4:  BUFFER+10 ;FIFTH WORD
001030 012502      DBUF5:  BUFFER+12
001032 000000      DSAVE:  0 ;TEMP REG.
001034 000000      DSAVE1: 0
001036 000000      DSAVE2: 0
001040 000000      DSAVE3: 0
001042 000000      HOLD:   0
001044 000000      TSAVE:  0
001046 000000      CNTR:   0
001050 000000      CHANGE: 0
001052 000000      LOKRB:  0

                                ;GS ADDRESSES AND INTERRUPT VECTORS

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

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

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

001074 000330      TIMEVT: 330 ;DISPLAY INTERRUPT VECTOR FOR TIME-OUT OR SHIFT-OUT
001076 000332      TIMEVT1: 332

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;MONITOR ROUTINE
435
436
437 001100 005737 002046 SCOPEA: TST KRBD ;TEST IF SW OR "KRB"
438 001104 001014 BNE SCOPEF ;BR IF "KRB"
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 006304 ASL 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 ;PINCLUSION
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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477					
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			(SP)+,R5
493	001310	012604			(SP)+,R4
494	001312	012603			(SP)+,R3
495	001314	012602			(SP)+,R2
496	001316	012601			(SP)+,R1
497	001320	012600			(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

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	#DPC, RO	;GET POINTER
511	001374	013701	001000			MOV	GSADD, R1	;GET SUPPLIED ADDRESS
512	001400	010120			STRA:	MOV	R1, (0)+	;UPDATE
513	001402	062701	000002			ADD	#2, R1	;THE
514	001406	022700	001064			CMP	#DPC+10, RO	;ADDRESSES
515	001412	001372				BNE	STRA	;UNTIL DONE
516	001414	012700	001064			MOV	#DDONE, RO	;GET POINTER
517	001420	013701	001002			MOV	GSVCT, R1	;GET SUPPLIED VECTOR
518	001424	010120			STRB:	MOV	R1, (0)+	;UPDATE
519	001426	062701	000002			ADD	#2, R1	;THE VECTORS
520	001432	022700	001100			CMP	#DDONE+14, RO	
521	001436	001372				BNE	STRB	
522	001440	005037	005556			CLR	SWITCH	;HOUSEKEEP
523	001444	005037	001042			CLR	HOLD	
524	001450	005004				CLR	R4	
525	001452	005037	001044			CLR	TSAVE	
526	001456	004737	001536		STRC:	JSR	PC, SETUP	;SET UP VECTORS
527	001460	005037	001042			CLR	HOLD	
528	001466	012737	001000	012004		MOV	#1000, RAY14A	;HOUSEKEEP X,Y ORIGIN FOR LIGHTPEN
529	001474	012737	000600	012006		MOV	#600, RAY14B	
530	001502	012737	030060	011764		MOV	#30060, DLT14A	;INITIALIZE X READOUT
531	001510	012737	030060	011766		MOV	#30060, DLT14A+2	
532	001516	012737	030060	011776		MOV	#30060, DLT14B	;INITIALIZE Y READOUT
533	001524	012737	030060	012000		MOV	#30060, DLT14B+2	
534	001532	000137	002050			JMP	FILED	;START THE TEST
535								
536	001536	012737	000062	000060	SETUP:	MOV	#62, #60	;RESET KRB VECTOR
537	001544	012737	000000	000062		MOV	#0, #62	
538	001552	042777	000100	177232		BIC	#100, #TKS	;CLEAR INT ENABLE
539	001560	005037	002046			CLR	KRBD	
540	001564	032737	000200	177570		BIT	#200, #DISPLAY	;TEST FOR "KRB" CONTROL
541	001572	001413				BEQ	SETUPA	;BR IF NOT
542	001574	005137	002046			COM	KRBD	;SET "KRB" CONTROL
543	001600	012737	001700	000060		MOV	#RETB, #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, #TIMEVT	;RESET TIME-OUT/SHIFT OUT VECTOR
551	001656	005077	177214			CLR	#TMEVT1	
552	001662	000207				RTS	PC	;EXIT
553								
554	001664	005777	177166		SETUPB:	TST	#DSR	;TEST FOR STOP
555	001670	100401				BMI	.+4	
556	001672	000000				HALT		;ERROR, INTERRUPT OCCURRED TO THE STOP
557								;VECTOR BUT STOP WAS NOT SET
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: BMI KYT1 ; <A
567 001740 022737 000017 001044 CMP 017, TSAVE ; >P
568 001746 100412 BMI 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 005037 001042 KYT1: CLR HOLD
579 002020 000002 RTI
580 002022 000000 HALT ; FATAL ERROR RTI FAILED
581 002024 012737 177777 005556 KYT3: MOV 0-1, SWITCH
582 002032 000002 RTI
583 002034 000000 HALT ; FATAL ERROR, RTI FAILED
584 002036 162737 000040 001044 KYT4: SUB 040, TSAVE ; CONVERT LC TO UC
585 002044 000734 BR KYT5
586 002046 000000 KRBD: 0

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```

      .LIST
;EXECUTE DIRECTORY FRAME
FILED: SCOPE
      JSR      5,MESG      ;EXIT TO DISPLAY A FRAME
      1000
      FRAME0      ;USING THE DIR. FRAME

;EXECUTE DOT REPEATIBILITY FRAME
FILE1: SCOPE
      JSR      5,MESG      ;EXIT TO DISPLAY A FRAME
      100000
      FRAME1      ;USING THE DOR REPEAT FRAME

;EXECUTE PINCUSHION FRAME
FILE2: SCOPE
      MOV      @BUFFER,R0      ;LOAD START ADDRESS
      JSR      PC,SETPNT      ;LOAD 0,0 ORIGIN
      MOV      @20,R1      ;SETUP COUNT
1S:    MOV      @INTX,(R0)+      ;LOAD INT LINE
      MOV      @MAXY,(R0)+      ;MAX Y
      MOV      @100,(R0)+      ;LOAD DELTA X
      MOV      @MINUSX+MAXY,(R0)+ ;LOAD - MAX Y
      DEC      R1      ;FINISHED ?
      BNE     1S      ;BR IF NOT
      MOV      @MINUSX+1,(R0)+ ;GO BACK 1 UNIT
      MOV      @0,(R0)+
      MOV      @INTX,(R0)+
      MOV      @MAXY,(R0)+
2S:    JSR      PC,SETPNT      ;PLOT LAST LINE
      MOV      @MAXY+1/100,R1 ;SET ORIGIN
      MOV      @INTX+MAXX,(R0)+ ;SETUP COUNT
      MOV      @0,(R0)+      ;LOAD DELTA X MAX
      MOV      @MINUSX+MAXX,(R0)+ ;LOAD DELTA Y = 0
      MOV      @100,(R0)+      ;RETRACE
      DEC      R1      ;LOAD DELTA Y OF 100
      BNE     2S      ;FINISHED ?
      MOV      @0,(R0)+      ;BR IF NOT
      MOV      @MINUSX+1,(R0)+
      MOV      @INTX+MAXX,(R0)+ ;PLOT LAST LINE
      MOV      @0,(R0)+
      MOV      @DSTOP,(R0)+ ;LOAD STOP
      MOV      @DJMP,(R0)+ ;LOAD JUMP
      MOV      @BUFFER,(R0)
      JMP      FILE2A

SETPNT: MOV      @POINT!INT4,(R0)+ ;LOAD POINT
      MOV      @0,(R0)+ ;AT X
      MOV      @0,(R0)+ ;AT Y
      MOV      @LONGV,(R0)+ ;LONG VECTOR
      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      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          FRAME2          ;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      S,MSG      ;DISPLAY TEST
667 002362 000001          |
668 002364 007334          FRAME3          ;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      S,MSG      ;DISPLAY TEST
674 002402 000001          |
675 002404 007724          FRAME3A          ;FRAME # 3A
676 002406 005337 001046          DEC      CNTR      ;DECREMENT COUNTER
677 002412 001356          BNE      FILE3A      ;BRANCH IF NOT COMPLETE

```

```

678
679
680
681
682
683 002414 104000
684 002416 012700 012470
685 002422 012720 174400
686 002426 012720 170052
687 002432 012720 117124
688 002436 012720 000000
689 002440 012720 001700
690 002446 012720 100000
691 002450 112720 000017
692 002456 112720 000017
693 002462 012737 000100 002666
694 002470 004737 002624
695 002474 012737 000140 002666
696 002508 004737 002624
697 002506 012737 000040 002666
698 002514 004737 002624
699 002528 012720 170040
700 002534 004737 002564
701 002538 004737 002730
702 002534 012720 170060
703 002540 004737 002564
704 002544 012720 173400
705 002550 012720 160000
706 002554 012720 012470
707 002560 000137 002746
708
709 002564 112720 000016
710 002570 012702 000000
711 002574 012703 000037
712 002600 110220
713 002602 005202
714 002604 022702 000017
715 002610 001774
716 002612 005303
717 002614 001371
718 002616 012720 020017
719 002622 000207
720
721 002624 012720 170040
722 002630 013702 002666
723 002634 004737 002712
724 002640 004737 002730
725 002644 012720 170060
726 002650 013702 002666
727 002654 004737 002712
728 002660 004737 002670
729 002664 000207
730
731 002666 000000
732
733 002670 112720 000015

```

```

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

```

```

FILE4: SCOPE
      MOV      @BUFFER,R0
      MOV      @STATSB!SIZED,(0)+
      MOV      @STATSA!ITALD!SYNOFF!GREEN,(0)+
      MOV      @POINT!INT4!LPOFF!BLKOFF!LINED,(0)+      ;LOAD POINT MPDE
      MOV      @0,(0)+
      MOV      @MAXY-77,(0)+
      MOV      @CHAR,(0)+
      MOV      @17,(0)+
      MOV      @17,(0)+
      MOV      @100,STCHAR      ;LOAD INITIAL CHAR.
      JSR      PC,LOADBF
      MOV      @140,STCHAR      ;LOAD INITIAL LC CHAR
      JSR      PC,LOADBF
      MOV      @40,STCHAR      ;LOAD LINE
      JSR      PC,LOADBF
      JSR      PC,LOADBF      ;LOAD NUMBERS AND PUNCT
      JSR      PC,LOADBF      ;LOAD LINE
      MOV      @STATSA!ITALD,(R0)+      ;LOAD NORMAL FONT
      JSR      PC,LOADSP      ;LOAD SPECIAL CHARS
      JSR      PC,SPACE      ;INSERT SPACES
      MOV      @STATSA!ITAL1,(R0)+      ;LOAD ITALICS FONT
      JSR      PC,LOADSP      ;LOAD SPIECAL
      MOV      @DSTOP,(R0)+      ;LOAD DSTOP
      MOV      @DSTOP,(R0)+
      MOV      @DSTOP,(R0)+
      JMP      FILE4

LOADSP: MOV      @16,(R0)+
      MOV      @R2
      MOV      @R3
      JSR      PC,LOADSP
      MOV      @R2,(R0)+
      INC      @R2
      CMP      @R2,@17,R2
      BEQ      @R3
      DEC      @R3
      BNE      @R3
      MOV      @20017,(R0)+
      RTS      PC

LOADBF: MOV      @STATSA!ITALD,(R0)+
      MOV      @STCHAR,R2
      JSR      PC,FILLIT
      JSR      PC,SPACE
      MOV      @STATSA!ITAL1,(R0)+
      MOV      @STCHAR,R2
      JSR      PC,FILLIT
      JSR      PC,CRLF
      RTS      PC

STCHAR: 0

CRLF:  MOV      @15,(0)+

```


F02

```

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 110220      FILLA:  MOVB      R2,(0)+
741 002720 005202      INC       R2
742 002722 005303      DEC       R3
743 002724 001374      BNE      FILLA
744 002726 000207      RTS          7
745
746 002730 012703 000010      SPACE:  MOV      #10,R3
747 002734 112720 000040      IS:     MOVB      #40,(R0)+ ;LOAD A SPACE
748 002740 005303      DEC       R3
749 002742 001374      BNE      IS             ;BR IF NOT DONE
750 002744 000207      RTS          PC          ;EXIT
751
752      ;ACTUAL DISPLAY ROUTINE
753
754 002746 012737 001000 003022  FILE4A: MOV      #1000,10S      ;LOAD A COUNTER
755 002754 012737 001700 012500  4S:   MOV      #MAXY-77,BUFFER+10 ;LOAD STARTING POINT
756 002762 004537 005412      JSR      RS,MSG
757 002766 000001      |
758 002770 012470      BUFFER
759
760 002772 012737 000400 012500      MOV      #400,BUFFER+10
761 003000 004537 005412      JSR      RS,MSG
762 003004 000001      |
763 003006 012470      BUFFER
764
765 003010 005337 003022      DEC      10S           ;FINISHED ?
766 003014 001357      BNE      4S           ;BR IF NOT
767 003016 000137 003024      JMP      FILES        ;GO TO NEXT TEST
768
769 003022 000000      10S:   0
770
771      ;EXECUTE DASH LINES AND BLINK
772
773 003024 104000      FILES: SCOPE
774 003026 004537 005412      JSR      5,MSG        ;EXIT TO DISPLAY A FRAME
775 003032 010000      10000
776 003034 010174      FRMS
;USING THE DASH AND BLINK FRAME

```

```

777
778
779
780
781 003036 104000
782 003040 012737 041777 010472
783 003046 012737 000010 001036
784 003054 012737 000000 001034
785 003062 012737 000040 001046
786 003070 012737 000200 001032
787 003076 013737 001034 010474
788 003104 004537 005412
789 003110 000001
790 003112 010462
791 003114 004537 005412
792 003120 000001
793 003122 010462
794 003124 062737 000010 010474
795 003130 005337 001032
796 003136 001366
797 003140 005337 001046
798 003144 001351
799 003146 000240
800 003150 005737 005556
801 003154 001342
802 003156 005237 001034
803 003160 005337 001036
804 003162 001335

```

;EXECUTE VECTOR LENGTH TEST <HORIZ>

```

FILE6: SCOPE
      MOV      @INTX!MAXX,DELTX6 ;SET UP VERTICAL HEIGHT
      MOV      @I0,DSAVE2 ;SET UP TIMER
      MOV      @0,DSAVE1
      LOOPA: MOV      @40,CNTR ;SET UP EXECUTION COUNT
      LOOPA1: MOV      @MAXY+1/I0,DSAVE ;SET UP
      MOV      DSAVE1,DELT6
      JSR      S,MSG ;EXIT TO DISPLAY FRAME
      |
      FRAME6 ;VECTOR LENGTH FRAME
      LOOPA2: JSR      S,MSG ;EXIT TO DISPLAY FRAME
      |
      FRAME6A ;VECTOR LENGTH FRAME
      ADD      @I0,DELT6 ;UPDATE ANGLE
      DEC      DSAVE ;FINISHED ALL THE ANGLES
      BNE     LOOPA2 ;BR IF NOT
      LOOPA3: DEC      CNTR ;DONE COUNT?
      BNE     LOOPA1 ;BR IF NOT
      NOP
      TST     SWITCH ;TEST SWITCH
      BNE     LOOPA ;BR IF HALT MOTION
      INC     DSAVE1 ;UPDATE INITIAL ANGLE
      DEC     DSAVE2 ;FINISHED ALL?
      BNE     LOOPA ;BR IF NOT

```

```

805
806
807
808 003170 104000
809 003172 012737 040000 001034
810 003200 012737 001777 010474
811 003206 012737 000010 001036
812 003214 012737 000040 001046
813 003222 012737 000200 001032
814 003230 013737 001034 010472
815 003236 004537 005412
816 003242 000001
817 003244 010462
818 003250 004537 005412
819 003252 000001
820 003254 010462
821 003256 062737 000010 010472
822 003264 005337 001032
823 003270 001366
824 003272 005337 001046
825 003276 001351
826 003300 000240
827 003302 005737 005556
828 003306 001342
829 003310 005237 001034
830 003314 005337 001036
831 003320 001335

```

;EXECUTE VECTOR LENGTH TEST <VERT>

```

FILE7: SCOPE
      MOV      @INTX,DSAVE1 ;SETUP INITIAL X
      MOV      @MAXY,DELT6 ;SETUP INITIAL Y
      MOV      @I0,DSAVE2 ;SETUP EXECUTION COUNT
      LOOPB: MOV      @40,CNTR ;SETUP DELAY
      LOOPB1: MOV      @200,DSAVE
      MOV      DSAVE1,DELTX6 ;EXIT TO DISPLAY FRAME
      JSR      S,MSG ;VECTOR LENGTH TEST FRAME
      |
      FRAME6 ;VECTOR LENGTH FRAME
      LOOPB2: JSR      S,MSG ;EXIT TO DISPLAY FRAME
      |
      FRAME6A ;VECTOR LENGTH FRAME
      ADD      @I0,DELTX6 ;UPDATE ANGLE
      DEC      DSAVE ;FINISHED ALL THE ANGLES
      BNE     LOOPB2 ;BR IF NOT
      LOOPB3: DEC      CNTR ;DONE COUNT?
      BNE     LOOPB1 ;BR IF NOT
      NOP
      TST     SWITCH ;TEST SWITCH
      BNE     LOOPB ;BR IF HALT MOTION
      INC     DSAVE1 ;UPDATE INITIAL ANGLE
      DEC     DSAVE2 ;FINISHED ALL?
      BNE     LOOPB ;BR IF NOT

```



```

831
832
833
834 003322 104000
835 003324 005037 010506
836 003330 004537 005412
837 003334 000050
838 003336 010504
839 003340 004537 005412
840 003344 000001
841 003346 010604
842 003350 000240
843 003352 005737 005556
844 003356 001364
845 003360 062737 000001 010506 D7C:
846 003366 022737 002000 010506
847 003374 001355
848
849
850
851 003376 104000
852 003400 005037 010550
853 003404 004537 005412
854 003410 000050
855 003412 010544
856 003414 004537 005412
857 003420 000001
858 003422 010604
859 003424 000240
860 003426 005737 005556
861 003432 001364
862 003434 062737 000001 010550 D7F:
863 003442 022737 002000 010550
864 003450 001355
865

```

;PHOSPHOR TEST <HORIZONTAL>

```

FILE10: SCOPE
D7A: CLR DELTX7
      JSR 5,MESG ;EXIT TO DISPLAY A FRAME
      SO
      FRM10 ;USING THE HORIZ FRAME
      JSR 5,MESG ;EXIT TO DISPLAY A FRAME
      I
      FRM10 ;USING THE PERIMETER BOX
      NOP
      TST SWITCH ;TEST THE "SWITCH"
      BNE D7A ;BR IF FREEZE THE MOVEMENT
      ADD #1,DELTX7 ;UPDATE THE X ORIGIN
      CMP #2000,DELTX7 ;TEST IF THE END
      BNE D7A ;BR IF NOT

```

;PHOSPHOR TEST <VERTICAL>

```

FILE11: SCOPE
D7D: CLR DELTY7
      JSR 5,MESG ;EXIT TO DISPLAY A FRAME
      SO
      FRM11 ;USING THE VERT FRAME
      JSR 5,MESG ;EXIT TO DISPLAY A FRAME
      I
      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

```

```

866
867
868
869 003452 104000
870 003454 012777 003550 175406
871 003462 013777 001004 175402
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 003564 042737 176000 011262
888 003572 022626
889 003574 012777 000001 175252
890 003602 000137 005430
891 003606 013777 001072 175254
892
893
894
895
896 003614 104000
897 003616 004537 005412
898 003622 010000
899 003624 011312

;INTENSITY LEVEL TEST
FILE12: SCOPE
MOV #RETL,ALPVCT ;SET UP LIGHT-PEN VECTOR
MOV GSBL,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 FLE12D ;YES, EXIT
MOV #DSTOP,RAYLPA ;NO, RESET MESSAGE
BR FLE12A ;BR BACK
RETL: MOV #DNOP,RAYLPA ;LIGHT-PEN HIT
MOV #YPOS,LPNT ;READ Y POSITION
BIC #176000,LPNT ;MASK THE BITS
CMP (SP)+,(SP)+ ;POP THE STACK
MOV #1,JDPC ;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

```



```

900
901
902
903
904 003626 104000
905 003630 012700 012470
906 003634 012720 114000
907 003640 012720 000240
908 003644 012720 001000
909 003650 012720 107004
910 003654 004737 003706
911 003660 012720 130000
912 003664 004737 003706
913 003670 012720 173400
914 003674 012720 160000
915 003700 012720 012470
916 003704 000413
917 003706 012737 000024 001046 LOADVT: MOV
918 003714 012720 040077 LADVT: MOV
919 003720 012720 004177 MOV
920 003724 005337 001046 DEC
921 003730 001371 BNE
922 003732 000207 RTS
923
924 003734 012737 004000 004104 FILE14: MOV
925 003742 012737 000200 011572 IS: MOV
926 003750 012737 000200 011574 MOV
927 003756 004537 005412 JSR
928 003762 000001 RS,MSG
929 003764 011566 |
930 003766 012737 001400 011572 FRAME14
931 003774 012737 000200 011574 MOV
932 004002 004537 005412 JSR
933 004006 000001 RS,MSG
934 004010 011566 |
935 004012 012737 001400 011572 FRAME14
936 004020 012737 001400 011574 MOV
937 004026 004537 005412 JSR
938 004032 000001 RS,MSG
939 004034 011566 |
940 004036 012737 000200 011572 FRAME14
941 004044 012737 001400 011574 MOV
942 004052 004537 005412 JSR
943 004056 000001 RS,MSG
944 004060 011566 |
945 004062 004537 005412 JSR
946 004066 000001 RS,MSG
947 004070 012470 |
948 004072 005337 004104 BUFFER
949 004076 001321 DEC
950 004100 000137 004106 BNE
951 004104 000000 JMP
952
105: 0 FILE15

```

;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 #DSTOP,(0)+ ;LOAD "DISPLAY STOP"
MOV #DJMP,(0)+ ;LOAD "DISPLAY JUMP"
MOV #BUFFER,(0)+ ;TO THE BUFFER ADDRESS
BR FILE14 ;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?
BNE LADVT ;BR IF NOT
RTS PC ;EXIT

```

```

FILE14: MOV #4000,105 ;LOAD COUNTER
IS: MOV #200,FRM14A ;LOAD FIRST OCTAGON
MOV #200,FRM14B ;LOAD SECOND OCTAGON
JSR RS,MSG ;DISPLAY OCT.
|
FRAME14
MOV #1400,FRM14A ;LOAD THIRD OCTAGON
MOV #MAXY-377,FRM14B ;LOAD SECOND OCTAGON
JSR RS,MSG ;DISPLAY 2ND OCT.
|
FRAME14
MOV #1400,FRM14A ;LOAD THIRD OCTAGON
MOV #MAXY-377,FRM14B ;LOAD FOURTH OCTAGON
JSR RS,MSG ;DISPLAY 4TH OCT.
|
FRAME14
JSR RS,MSG ;DISPLAY BAR
|
BUFFER
DEC 105 ;FINISHED ?
BNE IS ;BR IF NOT
JMP FILE15 ;NEXT TEST

```



```

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 #SBL,AL,PVCT1
1008 004360 012737 000100 001034 MOV #100,DSAVE1 ;SET UP COUNT
1009 004366 012700 012470 1S: MOV #BUFFER,RO ;LOAD START ADDR.
1010 004372 012737 000100 001032 MOV #100,DSAVE
1011 004400 012720 117744 MOV #POINT!INT7!LPON!LINE0,(RO)+ ;LOAD POINT
1012 004404 012720 000700 MOV #700,(RO)+ ;LOAD X POINT
1013 004410 012720 000474 MOV #474,(RO)+ ;LOAD Y POINT
1014 004414 004737 004556 JSR PC,LOADUP ;LOAD UP THE BUFFER
1015 004420 012720 173400 MOV #DSTOP,(RO)+ ;LOAD DSTOP
1016 004424 012720 160000 MOV #DJMP,(RO)+ ;LOAD DJUMP
1017 004430 012720 012470 MOV #BUFFER,(RO)+ ;LOAD RETURN ADDRESS
1018 004434 005037 005050 CLR HITCNT ;CLEAR HIT COUNT
1019 004440 012737 030060 012374 MOV #30060,FRM16B-2 ;PRESET THE READOUT
1020 004446 012737 030060 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 RS,MESG ;EXIT TO DISPLAY FRAME
1026 004466 000100 100 ;USINT THE LIGHT-PEN FRAME
1027 004470 011714 FRM16 ;BR BACK
1028 004472 000770 BR 4S
1029
1030 004474 004537 005412 6S: JSR RS,MESG ;EXIT TO DISPLAY FRAME
1031 004500 000001 1 ;ASCII SUBTITLE
1032 004502 012302 FRM16A ;EXIT TO DISPLAY FRAME
1033
1034 004504 004537 005412 JSR RS,MESG ;EXIT TO DISPLAY FRAME
1035 004510 000001 1 BUFFER
1036 004512 012470
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

```



```

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 005124 112737 000060 012464
1128 005132 012737 005206 000060
1129 005140 012737 000340 000062
1130 005146 052777 000100 173636
1131 005154 012737 000700 005330
1132 005162 012700 012470
1133 005166 004537 005412
1134 005172 000001
1135 005174 012404
1136 005176 005737 001052
1137 005202 001012
1138 005204 000770
1139 005206 017701 173602
1140 005212 042701 177600
1141 005216 012737 177777 001052
1142 005224 000002
1143 005226 000000
1144 005230 005037 001052
1145 005234 022701 000003
1146 005240 001002
1147 005242 000137 001456
1148 005246 005337 005330
1149 005252 001002
1150 005254 000137 005054
1151 005260 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,(0)+  ;MOV "DSTOPS"
        CMP      @BUFFER+1000,RO ;THRUOUT THE
        BNE     ECHOA          ;BUFFER
        CLR      LOKRB         ;HOUSE
        CLR      DSAVE        ;KEEPING
        MOVB    @60,KBOCT-4
        MOVB    @60,KBOCT-3      ;PRESET READOUT
        MOVB    @60,KBOCT-2
        MOVB    @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,RO     ;RESET RO
ECHOB: JSR     S,MSG          ;EXIT TO DISPLAY A FRAME
        I
        FRME17
        TST     LOKRB          ;USING THE KEYBOARD HEADER
        BNE     RET21         ;UPDATE A CHAR?
        BR     ECHOB         ;BR IF YES
RET117: MOV     @TKB,R1        ;GET A CHAR
        BIC     @177600,R1    ;MASK
        MOV     @-1,LOKRB     ;SET (FLAG)
        RTI
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
        MOVB   R1,(RO)+      ;SAVE BYTE
        MOVB   @17,(RO)     ;SHIFT-IN
        COM    DSAVE         ;COMP FLAG
        JMP    ECHOB        ;BR BACK
ECHOB:  MOVB   R1,(0)+      ;SAVE CHAR
        CLR    DSAVE        ;CLEAR FLAG
        JMP    ECHOB        ;BR BACK
CHRCNT: 200

```



```

1166                                     ;UPDATE OCTAL READOUT
1167
1168 005332 042703 176000 KBCHR: BIC      #176000,R3
1169 005336 004737 005376 JSR      PC,10$      ;LOAD BITS
1170 005342 110442 MOVB   R4,-(R2)      ;SAVE BITS
1171 005344 004737 005370 JSR      PC,11$      ;MOVE BITS
1172 005350 110442 MOVB   R4,-(R2)      ;SAVE BITS
1173 005352 004737 005370 JSR      PC,11$      ;MOVE BITS
1174 005356 110442 MOVB   R4,-(R2)      ;SAVE BITS
1175 005360 004737 005370 JSR      PC,11$
1176 005364 110442 MOVB   R4,-(R2)
1177 005366 000207 RTS      PC
1178 005370 006003 11$:  ROR   R3
1179 005372 006003 ROR   R3
1180 005374 006003 ROR   R3
1181 005376 010304 10$:  MOV   R3,R4      ;LOAD R4
1182 005400 042704 177770 BIC      #177770,R4  ;MASK BITS
1183 005404 062704 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 MSGA: MOV   FILE,#DPC      ;START DISPLAY
1189 005430 005077 173354 CLR   #PSW
1190 005434 000001 WAIT
1191 005436 005737 002046 TST   KRBD
1192 005442 001025 BNE   MSGAB
1193 005444 005337 005552 MSGAA: DEC   COUNT
1194 005450 001405 BEQ   MSGB
1195 005452 012777 000001 173374 MSGB: MOV   #1,#DPC      ;SINGLE STEP THE DISPLAY
1196 005460 000137 005430 JMP   MSGA
1197 005464 000240 MSGB: NOP
1198 005466 005737 002046 TST   KRBD
1199 005472 001010 BNE   MSGBA
1200 005474 005037 005556 CLR   SWITCH
1201 005500 032737 000100 177570 BIT   #BIT6,#DISPLAY
1202 005506 001402 BEQ   MSGBA
1203 005510 005137 005556 COM   SWITCH
1204 005514 000205 MSGBA: 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	170052		
1221	005570	103124		
1222	005572	017	017	
1223	005574	052107	032055	020060
1224	005602	051117	043440	026524
1225	005610	032064	053440	052111
1226	005616	020110	051126	033461
1227	005624	053040	051511	040525
1228	005632	020114	042524	052123
1229	005640	020040	046474	026504
1230	005646	030461	042055	043504
1231	005654	043524	040455	000076
1232	005662	015	012	012
1233	005670	042040	020040	044504
1234	005678	042522	052103	051117
1235	005700	131		
1236	005701	015	012	012
1237	005704	030060	036440	040440
1238	005712	036440	042040	051111
1239	005720	041505	047524	054522
1240	005728	015	012	
1241	005730	030460	036440	041040
1242	005736	036440	042040	052117
1243	005744	051040	050105	040505
1244	005752	044524	044502	044514
1245	005760	044524		
1246	005762	015	012	
1247	005764	031060	036440	041440
1248	005772	036440	050040	047111
1249	006000	052503	044123	047511
1250	006006	020116	047101	020104
1251	006014	042526	052103	051117
1252	006022	041440	051125	040526
1253	006030	052524	042523	036040
1254	006036	020130	051117	054440
1255	006044	047440	043106	042523
1256	006052	020124	042101	027112
1257	006060	076		
1258	006061	015	012	
1259	006063	060	020063	020075
1260	006070	020104	020075	041517
1261	006076	040524	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	006134	051101	041501	042524
1268	006142	020122	042523	020124
1269	006150	041474	040510	027122
1270	006156	040440	045104	037056
1271	006164	015	012	

FRMO: 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

1272	006166	032460	036440	043040
1273	006174	036440	042040	051501
1274	006202	020110	044514	042516
1275	006210	020123	047101	020104
1276	006216	046102	047111	113
1277	006223	015	012	
1278	006225	060	020056	020075
1279	006232	020107	020075	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	006276	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	044524	040503	020114
1292	006340	046101	052103	051117
1293	006346	040440	043516	042514
1294	006354	036040	042101	027112
1295	006362	054440	053040	041505
1296	006370	047524	020122	042514
1297	006376	043516	044124	076
1298	006403	015	012	
1299	006405	061	020050	020075
1300	006412	020111	020075	047510
1301	006420	044522	047532	052116
1302	006426	046101	050040	047510
1303	006434	050123	047510	020122
1304	006442	042524	052123	
1305	006446	015	012	
1306	006450	030461	036440	045040
1307	006456	036440	053040	051105
1308	006464	044524	040503	020114
1309	006472	044120	051517	044120
1310	006500	051117	052040	051505
1311	006506	124		
1312	006507	015	012	
1313	006511	061	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/

1328	006624	020115	020075	044123
1329	006632	051117	020124	042526
1330	006640	052103	051117	020123
1331	006646	047101	020104	042522
1332	006654	040514	044524	042526
1333	006662	050040	044517	052116
1334	006670	015	012	
1335	006672	032461	036440	047040
1336	006700	036440	043440	040522
1337	006706	044120	046120	052117
1338	006714	052040	051505	124
1339	006721	015	012	
1340	006723	061	020066	020075
1341	006730	020117	020075	044514
1342	006736	044107	020124	042520
1343	006744	020116	047506	046114
1344	006750	053517		
1345	006754	015	012	
1346	006756	033461	036440	050040
1347	006764	036440	045440	054505
1348	006772	047506	051101	020104
1349	007000	041506	047510	052040
1350	007006	051506	124	
1351	007011	015	012	012
1352	007014	020040	052522	047502
1353	007022	052125	052040	020117
1354	007030	042522	040515	047111
1355	007036	047440	020116	044124
1356	007044	020105	040520	052124
1357	007052	051105	116	
1358	007055	015	012	
1359	007057	040	041440	020122
1360	007064	047524	051440	046106
1361	007072	041505	020124	052523
1362	007100	026502	044520	052103
1363	007106	051125	020105	051117
1364	007114	051440	047524	020120
1365	007122	047515	044524	047117
1366	007130	000040		
1367				
1368	007132	173400		
1369	007134	160000		
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
.ASCIZ / 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 007220 164000
 1398 007222 173400
 1399 007224 160000
 1400 007226 007140
 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

MAXY+1/2
 INTX+1777
 MAXY
 INTX+1000
 MAXY+1/2
 INTX
 MAXY
 DNOP
 DNOP
 DNOP
 DNOP
 DNOP
 DNOP
 DNOP
 DSTOP
 DJMP
 FRME1

;FILE 2 <ANALOG TUNE-UP TEST >

FRME2: POINT!INT2!LPOFF!BLKOFF!LINE0
 0
 0
 STATSA!ITALD!SYNOFF!GREEN
 LONGV
 INTX!MAXX ; +X, +Y
 0
 INTX ; +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
 MINUSY!MAXY
 INTX!MAXX
 MAXY
 INTX!MINUSX!MAXX
 MINUSX!MAXY
 MAXX
 0
 INTX!MINUSX!MAXX
 MAXY
 INTX!MAXX
 MINUSX!MAXY
 DSTOP
 DJMP
 FRME2

;OCTAGONS

1440
1441 007334 117124
1442 007336 000774
1443 007340 000564
1444 007342 170052
1445 007344 110000
1446 007346 040007
1447 007350 000000
1448 007352 040007
1449 007354 000007
1450 007356 040000
1451 007360 000007
1452 007362 060007
1453 007364 000007
1454 007366 060007
1455 007370 000000
1456 007372 060007
1457 007374 020007
1458 007376 040000
1459 007400 020007
1460 007402 040007
1461 007404 020007
1462 007406 114000
1463 007410 000770
1464 007412 000550
1465 007414 110000
1466 007416 040017
1467 007420 000000
1468 007422 040017
1469 007424 000017
1470 007426 040000
1471 007430 000017
1472 007432 060017
1473 007434 000017
1474 007436 060017
1475 007440 000000
1476 007442 060017
1477 007444 020017
1478 007446 040000
1479 007450 020017
1480 007452 040017
1481 007454 020017
1482 007456 114000
1483 007460 000760
1484 007462 000520
1485 007464 110000
1486 007466 040037
1487 007470 000000
1488 007472 040037
1489 007474 000037
1490 007476 040000
1491 007500 000037
1492 007502 060037
1493 007504 000037
1494 007506 060037
1495 007510 000000

FRME3: POINT!INT4!LPOFF!BLKOFF!LINE0

774
564
STATSA!ITALO!SYNOFF!GREEN
LONGV
INTX+7
0
INTX+7
7
INTX
7
INTX!MINUSX+7
7
INTX!MINUSX+7
0
INTX!MINUSX+7
MINUSX+7
INTX
MINUSX+7
INTX+7
MINUSX+7
POINT
770
550
LONGV
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
 1497 007514 020037
 1498 007516 040000
 1499 007520 020037
 1500 007522 040037
 1501 007524 020037
 1502 007526 114000
 1503 007530 000740
 1504 007532 000440
 1505 007534 110000
 1506 007536 040077
 1507 007540 000000
 1508 007542 040077
 1509 007544 000077
 1510 007546 040000
 1511 007550 000077
 1512 007552 060077
 1513 007554 000077
 1514 007556 060077
 1515 007560 000000
 1516 007562 060077
 1517 007564 020077
 1518 007566 040000
 1519 007570 020077
 1520 007572 040077
 1521 007574 020077
 1522 007576 114000
 1523 007600 000700
 1524 007602 000300
 1525 007604 110000
 1526 007606 040177
 1527 007610 000000
 1528 007612 040177
 1529 007614 000177
 1530 007616 040000
 1531 007620 000177
 1532 007622 060177
 1533 007624 000177
 1534 007626 060177
 1535 007630 000000
 1536 007632 060177
 1537 007634 020177
 1538 007636 040000
 1539 007640 020177
 1540 007642 040177
 1541 007644 020177
 1542 007646 114000
 1543 007650 000600
 1544 007652 000000
 1545 007654 110000
 1546 007656 040377
 1547 007660 000000
 1548 007662 040377
 1549 007664 000377
 1550 007666 040000
 1551 007670 000377

INTX!MINUSX+37
 MINUSX+37
 INTX
 MINUSX+37
 INTX+37
 MINUSX+37
 POINT
 740
 440
 LONGV
 INTX+77
 0
 INTX+77
 77
 INTX
 77
 INTX!MINUSX+77
 77
 INTX!MINUSX+77
 0
 INTX!MINUSX+77
 MINUSX+77
 INTX
 MINUSX+77
 INTX+77
 MINUSX+77
 POINT
 700
 300
 LONGV
 INTX+177
 0
 INTX+177
 177
 INTX
 177
 INTX!MINUSX+177
 177
 INTX!MINUSX+177
 0
 INTX!MINUSX+177
 MINUSX+177
 INTX
 MINUSX+177
 INTX+177
 MINUSX+177
 POINT
 600
 0
 LONGV
 INTX+377
 0
 INTX+377
 377
 INTX
 377

;OCTOGON BY LENGTH OF 77

;OCTOGON BY LENGTH OF 177

;OCTOGON BY LENGTH OF 377

1553	007672	060377
1553	007674	000377
1554	007676	060377
1555	007700	000000
1556	007702	060377
1557	007704	020377
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		000007
1572		000004
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	020004
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
DJMP
FRME3
;SQUARES 7,17,37,77,177,377,777 WIDE
FRME3A: 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
1609 010036 110000
1610 010040 040077
1611 010042 000000
1612 010044 040000
1613 010046 000077
1614 010050 060077
1615 010052 000000
1616 010054 040000
1617 010056 020077
1618 010060 020037
1619 010062 020037
1620
1621 010064 110000
1622 010066 040177
1623 010070 000000
1624 010072 040000
1625 010074 000177
1626 010076 060177
1627 010100 000000
1628 010102 040000
1629 010104 020177
1630 010106 020077
1631 010110 020077
1632
1633 010112 110000
1634 010114 040377
1635 010116 000000
1636 010120 040000
1637 010122 000377
1638 010124 060377
1639 010126 000000
1640 010130 040000
1641 010132 020377
1642 010134 020177
1643 010136 020177
1644
1645 010140 110000
1646 010142 040777
1647 010144 000000
1648 010146 040000
1649 010150 000777
1650 010152 060777
1651 010154 000000
1652 010156 040000
1653 010160 020777
1654 010162 020377
1655 010164 020377
1656
1657 010166 173400
1658 010170 160000
1659 010172 007724
1660
1661
1662
1663 010174 117000

.LIST
LONGV
INTX+77
0
INTX
77
INTX!MINUSX+77
0
INTX
MINUSX+77
MINUSX+37
MINUSX+37
.LIST
LONGV
INTX+177
0
INTX
177
INTX!MINUSX+177
0
INTX
MINUSX+177
MINUSX+77
MINUSX+77
.LIST
LONGV
INTX+377
0
INTX
377
INTX!MINUSX+377
0
INTX
MINUSX+377
MINUSX+177
MINUSX+177
.LIST
LONGV
INTX+777
0
INTX
777
INTX!MINUSX+777
0
INTX
MINUSX+777
MINUSX+377
MINUSX+377
.LIST
DSTOP
DJMP
FRME3A

;BY 77 AND 37

;BY 177 AND 77

;BY 377 AND 177

;BY 777 AND 377

;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	110030			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	010262	020040	020040		
1685	010266	110005			LONGV!LINE1
1686	010270	040400			40400
1687	010272	000000			0
1688	010274	000400			400
1689	010276	000000			0
1690	010300	110030			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 010440 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
DELTY6: 0
DSTOP
DJMP
FRME6A
;PHOSPHOR TEST
FRME10: POINT
DELTX7: 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 010560 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 017 017
1815 010656 047111 042524 051516
1816 010664 052111 020131 020067
1817 010672 020040
1818 010674 110000
1819 010676 041000
1820 010700 000000
1821 010702 130000
1822 010704 057600
1823 010706 103400
1824 010710 015 012 012
1825 010713 012
1826 010714 047111 042524 051516
1827 010722 052111 020131 020066
1828 010730 020040
1829 010732 110000
1830 010734 041000
1831 010736 000000

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 164000
 1901 011232 164000
 1902 011234 164000
 1903 011236 164000
 1904 011240 164000
 1905 011242 164000
 1906 011244 164000
 1907 011246 164000
 1908 011250 173400
 1909 011252 164000
 1910 011254 164000
 1911
 1912 011256 117100
 1913 011260 001500
 1914 011262 001200
 1915 011264 100000
 1916 011266 044514
 1917 011274 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

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 060400
 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
 POINT
 0
 500

;TOP SIDE

;RIGHT SIDE

;BOTTOM SIDE

101

15,101

;"CR" AND AN "A"

E04

2000	011536	110000
2001	011540	020012
2002	011542	000000
2003	011544	100000
2004	011546	040
2005	011550	164000
2006	011552	164000
2007	011554	173400
2008	011556	164000
2009	011560	164000
2010	011562	160000
2011	011564	011312
2012		

102

LONGV
MINUSX+12
0
CHAR
BYTE 40,102
DNOP
DNOP
DSTOP
DNOP
DNOP
DJMP
FRME13

;"SPACE" AND AN "B"

2013
2014
2015 011566 170052
2016 011570 117124
2017 011572 000000
2018 011574 000000
2019 011576 104000
2020 011600 056200
2021 011602 056271
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 011666 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!ITALD!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


```

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 020104 043117
2181 012340 053040 042511 020127
2182 012346 015 012 012
2183 012351 116 046525 042502
2184 012356 020122 043117 044040
2185 012364 052111 020123 020075
2186 012372 030060 030060
2187 012376 173400
2188 012400 160000
2189 012402 012302
2190
2191 012404 114124
2192 012406 000000
2193 012410 001600
2194 012412 170052
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
2207
2208 012470 164000
2209
2210 000001

```

```

FRME16
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

FRME17: POINT!LPOFF!BLKOFF!LINED
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

```

;MUST BE JUST BEFORE THE BUFFER

D7F	003434	862#						
ECHOA	005060	1119#	1121					
ECHOB	005316	1155#	1160#					
ECHOC	005166	1133#	1138	1159	1162			
FILE	005554	1187*	1188	1214#				
FILE0	002050	460	534	595#	998			
FILE1	002062	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	005052	475	1117#	1150				
FILE2	002074	462	609#					
FILE2A	002274	638	646#					
FILE2B	002302	647#	658					
FILE2C	002322	648	654#					
FILE2D	002332	652	657#					
FILE3	002340	463	662#					
FILE3A	002350	664#	670	677				
FILE3B	002376	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#					
FRME0	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	007334	668	1441#	1564				
FRME3A	007724	675	1567#	1659				
FRME5	010174	776	1663#	1724				
FRME6	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					

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				
LOCPA	003062	784#	800	803										
LOCPA1	003070	785#	797											
LOCPA2	003114	790#	795											
LOCPA3	003140	796#												
LOOPB	003214	811#	827	830										
LOOPB1	003222	812#	824											
LOOPB2	003246	817#	822											
LOOPB3	003272	823#												
LOWPR	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#

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#									
TMEVT1 001076	433#	550	551#										
TSAVE 001044	412#	525#	562#	563#	564	567#	569	571	576	588#			
XPOS 001060	423#	1066											
YPOS 001062	424#	886	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	1083	1195									
OCTGN	20148	2020	2032	2044									
OCTGON	14458	1465	1485	1505	1525	1545							
SQUARE	15718	1573	1585	1597	1609	1621	1633	1645					

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

ADD	513	519	793	820	845	862	967	982	1099	1108	1183						
ASL	453																
ASR	1096	1097	1105	1106													
BEO	441	541	565	648	715	882	977	990	1069	1098	1107	1194	1202	1208			
BIC	453	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	984	987	1023	1040	1043	1051	1060	1101	1110	1121	1137	1146	1149		
	1155	1199	1199	1206													
BR	589	658	671	876	884	915	966	1028	1074	1112	1138						
CLR	439	523	523	524	525	527	539	549	551	566	573	574	580	835	852		
	1018	1093	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				
ENT	373																
HALT	378	487	503	556	559	582	586	1143									
INC	713	741	801	828	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	548	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	886	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		

EOS

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

MACY11 27(732) 09-SEP-76 15:25 PAGE 59

.ASCIZ	2065	2070	2071	2073	2074	2178	2183	2202								
.BYTE	1223	1359	1916	2197					1271	1277	1288	1298	1305	1312	1321	1326
	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				
.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)

