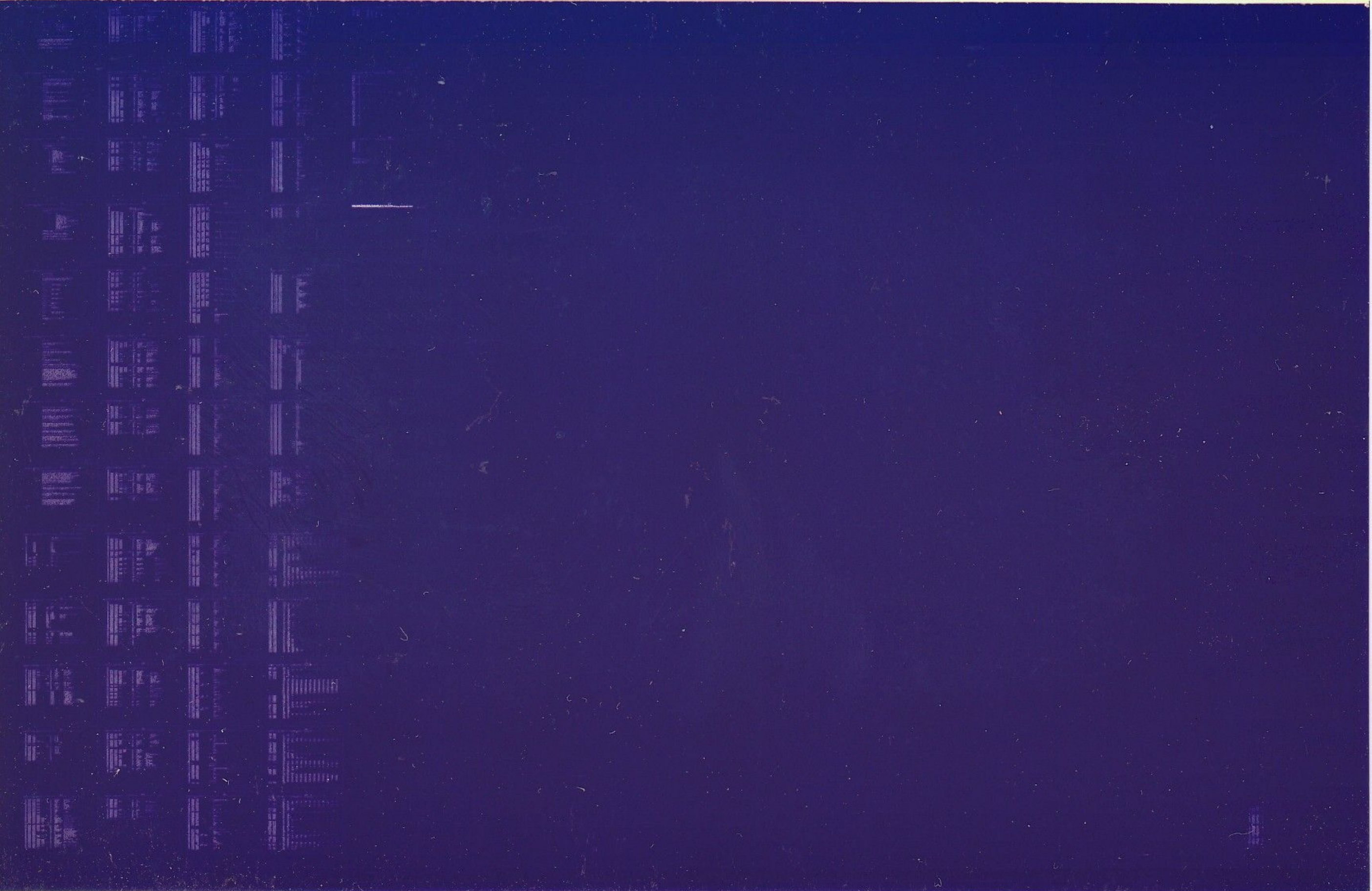


GT40

VISUAL TEST
MD-11-DDGTC-C

EP-DDGTC-C-DL-B
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B01

GT40/GT44 WITH VR14 VISUAL DISPLAY TEST MAINDEC-11-DOGTC-C
DOGTC.P11 15-SEP-76 00:00

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IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DOGTC-C-D
PRODUCT NAME: GT40/GT44 VISUAL DISPLAY TEST
WITH VR14 DISPLAY
DATE: DECEMBER 1976
MAINTAINER: DIAGNOSTIC GROUP

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1. ABSTRACT

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

THIS PROGRAM CONTAINS A SERIES OF PATTERNS THAT ARE USED AS AIDS IN THE ALIGNMENT AND ADJUSTMENT OF THE GT40/GT44 DISPLAY SYSTEM WITH A VR14. FOR THIS TEST THE MAINTENCE SWITCHES ARE NOT USED (NORMAL POSITION).

2. REQUIREMENTS

2.1 EQUIPMENT

GT40 DISPLAY SYSTEM WITH VR14 DISPLAY SCOPE OR
GT44 DISPLAY SYSTEM WITH VR14 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 3-3.

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	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 GRAPHPLOT INCREMENT TEST

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

5.1.7 LIGHT PEN FOLLOW

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

6. ERRORS

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

7. RESTRICTIONS

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

8. MISCELLANEOUS

8.1 DEVICE ADDRESS PROGRAM LOCATIONS

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

9. PROGRAM DESCRIPTION

9.1 DIRECTORY

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

9.2 DOT REPEATIBILITY

THIS TEST INTENSIFIES A DOT IN EACH 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.

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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 INFINITELY 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 DEPRESSED THE CHARACTER IS DISPLAYED ON THE SCREEN. IN SELECTING THE SHIFT-OUT MODE, IF THE KEY DEPRESSED IS NOT A CONTROL CHARACTER, THE PROGRAM WILL TRAP TO THE SHIFT-OUT VECTOR. AN OCTAL CHARACTER VALUE READOUT IS ALSO DISPLAYED AS AN AID IN ADJUSTING THE TTY CLOCK.

..LIST

000000

000000
000001
000002
000003
000004
000005
000006
000007
104000
000004
000500
177570
000024
000024
000028
000030
000030
000032
000032
000170
000170
000172
000172

000000
000001
000002
000003
000004
000005
000006
000007
104000
000004
000500
177570
000024
001250
000340 ...
000030
001100
000340
000170
000000
177570

.ENABL ABS,AMA
.TITLE GT-40/GT-44 WITH VR14 VISUAL DISPLAY TEST MAINDEC-11-DDGTC-C
.LIST ME
.NLIST MC,MD,CND
R0=%0
R1=%1
R2=%2
R3=%3
R4=%4
R5=%5
SP=%6
PC=%7
SCOPE=EMT
ERRVEC=4
STKPTR=500
DSWR=177570 ;1145 LIGHT DISPLAY REGISTER
:0-776 IS FILLED WITH .+2. HALT
.LIST
.=24
.WORD LOWPWR
340
.=30
.WORD SCOPEA ;EMT RETURN
340
.=170
SWREG: .WORD 0
SWR: .WORD DSWR

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396
397
398 000200 000200      . =200
399          000137 001356  JMP      START ;DISFLAY TEST
400
401 001000 001000      . =1000
402 001002 000320      GSADD: 172000 ;DISPLAY STARTING ADDRESS
403 001004 000200      GSVCT: 320 ;DISPLAY INTERRUPT VECTOR STARTING ADDRESS
404          000200      GSBRL: 200 ;DISPLAY BR LEVEL
405 001006 000000      ICNT: 0
406 001010 177776      PSW: 177776
407 001012 177560      TKS: 177560
408 001014 177562      TKB: 177562
409 001016 012536      DBUF: BUFFER ;FIRST WORD IN THE DISPLAY BUFFER
410 001020 012540      DBUF1: BUFFER+2 ;SECOND WORD
411 001022 012542      DBUF2: BUFFER+4 ;THIRD WORD
412 001024 012544      DBUF3: BUFFER+6 ;FOURTH WORD
413 001026 012546      DBUF4: BUFFER+10 ;FIFTH WORD
414 001030 012550      DBUF5: BUFFER+12
415 001032 000000      DSAVE: 0 ;TEMP REG.
416 001034 000000      DSAVE1: 0
417 001036 000000      DSAVE2: 0
418 001040 000000      DSAVE3: 0
419 001042 000000      HOLD: 0
420 001044 000000      TSAVE: 0
421 001046 000000      CNTR: 0
422 001050 000000      CHANGE: 0
423 001052 000000      LOKRB: 0
424
425
426
427 ;GS ADDRESSES AND INTERRUPT VECTORS
428
429 001054 172000      DPC: 172000 ;DISPLAY PROGRAM COUNTER
430 001056 172002      DSR: 172002 ;DISPLAY STATUS REGISTER
431 001060 172004      XPOS: 172004 ;DISPLAY X AXIS REGISTER
432 001062 172006      YPOS: 172006 ;DISPLAY Y AXIS REGISTER
433
434 001064 000320      DDONE: 320 ;DISPLAY INTERRUPT VECTOR FOR STOP
435 001066 000322      DDONE1: 322
436
437 001070 000324      LPVCT: 324 ;DISPLAY INTERRUPT VECTOR FOR LIGHT-PEN
438 001072 000326      LPVCT1: 326
439
440 001074 000330      TIMEVT: 330 ;DISPLAY INTERRUPT VECTOR FOR TIME-OUT OR SHIFT-OUT
441 001076 000332      TMEVT1: 332
442

```

```

443          :MONITOR ROUTINE
444
445 001100 005737 002114 SCOPEA: TST      KRBD      ;TEST IF SW OR "KRB"
446 001104 001014          BNE      SCOPEF   ;BR IF "KRB"
447 001106 005037 005624 CLR      SWITCH   ;CLEAR "SWITCH"
448 001112 032777 000100 177052 BIT      #100,JSWR ;TEST FOR "HOLD/STOP SWITCH"
449 001120 001402          BEQ      SCOPEE   ;BR IF CLEARED
450 001122 005137 005624 COM      SWITCH   ;SET SWITCH
451 001126 032777 000400 177036 SCOPEE: BIT      #400,JSWR ;TEST BIT 8
452 001134 001010          BNE      SCOPEB   ;
453 001136 005737 001042 SCOPEF: TST      HOLD    ;TEST FOR "HOLD/STOP"
454 001142 001012          BNE      SCOPED   ;BR IF SET
455 001144 000240          NOP
456 001146 004737 001536 JSR      PC,SETUP ;RESET HOUSEKEEPING
457 001152 000240          NOP
458 001154 000002          RTI
459 001156 017704 177010 SCOPEB: MOV      @SWR,R4 ;READ SWITCHES
460 001162 042704 177760 SCOPEC: BIC      #177760,R4 ;MASK TO BITS 4-15
461 001166 006304          ASL      R4      ;MOVE LEFT
462 001170 012706 000500 SCOPED: MOV      #STKPTR,SP ;RESET STACK
463 001174 000240          NOP
464 001176 004737 001536 JSR      PC,SETUP ;RESET HOUSEKEEPING
465 001202 000240          NOP
466 001204 000174 001210 JMP      @DISPTC(R4) ;JMP TO THAT TEST
467
468 001210 002120 DISPTC: FILE0+2 ;DIRECTORY
469 001212 002132 FILE1+2 ;DOT REPEATIBILITY
470 001214 002144 FILE2+2 ;PINCUSHION
471 001216 002410 FILE3+2 ;OCTAGONS OR SQUARES
472 001220 002464 FILE4+2 ;CHARACTER SET
473 001222 003074 FILE5+2 ;DASH LINES AND BLINK
474 001224 003106 FILE6+2 ;X VECTOR LENGTH
475 001226 003240 FILE7+2 ;Y VECTOR LENGTH
476 001230 003372 FILE10+2 ;X PHOSPHOR TEST
477 001232 003446 FILE11+2 ;Y PHOSPHOR TEST
478 001234 003522 FILE12+2 ;INTENSITY LEVEL AND LIGHTPEN
479 001236 003664 FILE13+2 ;EDGE SQUARES
480 001240 003676 FILE14+2 ;SHORT VECTOR RELATIVE POINT TEST
481 001242 004156 FILE15+2 ;GRAPHLOT TEST
482 001244 004412 FILE16+2 ;LIGHT-PEN FOLLOW
483 001246 005122 FILE17+2 ;KEY BOARD ECHO
484
    
```

```

485
486
487 001250 010046          LOWPWR: MOV      R0,-(SP)
488 001252 010146          MOV      R1,-(SP)
489 001254 010246          MOV      R2,-(SP)
490 001256 010346          MOV      R3,-(SP)
491 001260 010446          MOV      R4,-(SP)
492 001262 010546          MOV      R5,-(SP)
493 001264 010637 001300  MOV      SP,LOWSV
494 001270 012737 001302 000024  MOV      #HIGPWR,2#24
495 001276 000000          HALT
496
497 001300 000000          LOWSV:  0
498
499 001302 013706 001300  HIGPWR: MOV      LOWSV,SP
500 001306 012605          MOV      (SP)+,R5
501 001310 012604          MOV      (SP)+,R4
502 001312 012603          MOV      (SP)+,R3
503 001314 012602          MOV      (SP)+,R2
504 001316 012601          MOV      (SP)+,R1
505 001320 012600          MOV      (SP)+,R0
506 001322 012737 001250 000024  MOV      #LOWPWR,2#24
507 001330 012706 000500          MOV      #STKPTR,SP
508 001334 000240          NOP
509 001336 000240          NOP
510 001340 000240          NOP
511 001342 000000          HALT
512 001344 000240          NOP
513 001346 000240          NOP
514 001350 000240          NOP
515 001352 000137 001170  JMP      SCOPED

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516 001356 012706 000500          START:  MOV    #STKPTR,SP      ;SET UP THE STACK
517 001362 012777 000340 177420      MOV    #340,DP5W      ;RAISE PSW
518 001370 012700 001054          MOV    #DPC,RO       ;GET POINTER
519 001374 013701 00100C          MOV    GSADD,R1      ;GET SUPPLIED ADDRESS
520 001400 010120          STRA:  MOV    R1,(0)+  ;UPDATE
521 001402 062701 000002          ADD    #2,R1        ;THE
522 001406 022700 001064          CMP    #DPC+10,RO   ;ADDRESSES
523 001412 001372          BNE    STRA         ;UNTIL DONE
524 001414 012700 001064          MOV    #DDONE,RO    ;GET POINTER
525 001420 013701 001002          MOV    GSVCT,R1     ;GET SUPPLIED VECTOR
526 001424 010120          STRB:  MOV    R1,(0)+  ;UPDATE
527 001426 062701 000002          ADD    #2,R1        ;THE VECTORS
528 001432 022700 001100          CMP    #DDONE+14,RO
529 001436 001372          BNE    STRB
530 001440 005037 005624          CLR    SWITCH      ;HOUSEKEEP
531 001444 005037 001042          CLR    HOLD
532 001450 005004          CLR    R4
533 001452 005037 001044          CLR    TSAVE
534 001456 004737 001536          STRC:  JSR    PC,SETUP ;SET UP VECTORS
535 001462 005037 001042          CLR    HOLD
536 001466 012737 001000 012052      MOV    #1000,RAY14A ;HOUSEKEEP X,Y ORIGIN FOR LIGHTPEN
537 001474 012737 000600 012054      MOV    #600,RAY14B
538 001502 012737 030060 012032      MOV    #30060,DLT14A ;INITIALIZE X READOUT
539 001510 012737 030060 012034      MOV    #30060,DLT14A+2
540 001516 012737 030060 012044      MOV    #30060,DLT14B ;INITIALIZE Y READOUT
541 001524 012737 030060 012046      MOV    #30060,DLT14B+2
542 001532 000137 002116          JMP    FILED        ;START THE TEST
543
544 001536 012737 000062 000060      SETUP: MOV    #62,DP60   ;RESET KRB VECTOR
545 001544 012737 000000 000062      MOV    #0,DP62
546 001552 042777 000100 177232      BIC    #100,DPKTS   ;CLEAR INT ENABLE
547 001560 005037 002114          CLR    KRBD
548 001564 013746 000004          MOV    DPERRVEC,-(SP) ;SAVE VECTOR CONTENTS
549 001570 012737 001616 000004      MOV    #15,DPERRVEC ;SET UP FOR TRAP
550 001576 012737 177570 000172      MOV    #DSWR,DP5WR  ;SET UP TO TEST FOR SWITCH REGISTER
551 001604 022777 177777 176360      CMP    #-1,DP5WR   ;TEST FOR SWITCH REGISTER
552 001612 001005          BNE    35          ;SWTICH REGISTER PRESENT
553 001614 000401          BR    25          ;NO SWITCH REGISTER
554 001616 022626          15:  CMP    (SP)+,(SP)+  ;POP 2 WORDS OFF STACK
555 001620 012737 000170 000172      25:  MOV    #SWREG,DP5WR ;SET UP FOR SOFTWARE SWITCH REGISTER
556 001626 012637 000004          35:  MOV    (SP)+,DPERRVEC ;RESTORE VECTOR CONTENTS
557 001632 032777 000200 176332      BIT    #200,DP5WR  ;TEST FOR "KRB" CONTROL
558 001640 001413          BEQ    SETUPA     ;BR IF NOT
559 001642 005137 002114          COM    KRBD       ;SET "KRB" CONTROL
560 001646 012737 001746 000060      MOV    #RETB,DP60  ;SET LP "KRB" INT
561 001654 012737 000340 000062      MOV    #340,DP62
562 001662 052777 000100 177122      BIS    #100,DPKTS  ;ENABLE "KRB" INT
563 001670 012777 001732 177166      SETUPA: MOV    #SETUPB,DDONE ;SET UP GT DONE VECTOR
564 001676 012777 000340 177162      MOV    #340,DDONE1
565 001704 013777 001072 177156      MOV    LPVCT1,DPVCT ;RESET LIGHT-PEN VECTOR
566 001712 005077 177154          CLR    DPVCT1
567 001716 013777 001076 177150      MOV    TMEVT1,DPMEVT ;RESET TIME-OUT/SHIFT OUT VECTOR
568 001724 005077 177146          CLR    DPMEVT1
569 001730 000207          RTS    PC         ;EXIT

```

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001743 005000 177120 SETUPB: TST 005R ;TEST FOR STOP
001744 000000 BMT ;
001745 000000 HALT ;
001746 000002 RTI ;
001747 000000 HALT ;

001748 117737 177042 001044 RETB: MOVB JTKB, TSAVE ;READ THE CHARACTER
001749 042737 177600 001044 BIC #177600, TSAVE ;MASK TO 7 BITS
001750 022737 000015 001044 CMP #15, TSAVE ;TEST FOR "CR"
001751 001440 BEQ KYT3 ;BR IF
001752 005037 005624 CLR SWITCH ;CLEAR "SWITCH"
001753 162737 000101 001044 SUB #101, TSAVE ;MAKE 0-77
001754 100428 BMI KYT1 ;CR
001755 022737 000017 001044 CMP #17, TSAVE ;
001756 100412 BMI KYT2 ;P
001757 013704 001044 MOV TSAVE, R4 ;
001758 012737 177777 001050 MOV #-1, CHANGE ;
001759 005037 005624 CLR SWITCH ;
001760 005037 001042 CLR HOLD ;
001761 000002 RTI ;EXIT
001762 022737 000076 001044 KYT2: CMP #76, TSAVE ;
001763 001015 BNE KYT4 ;
001764 012737 177777 001042 MOV #-1, HOLD ;RUBOUT
001765 000002 RTI ;EXIT
001766 005037 001042 KYT1: CLR HOLD ;
001767 000002 RTI ;
001768 000000 HALT ;FATAL ERROR RTI FAILED

001769 012737 177777 005624 KYT3: MOV #-1, SWITCH ;
001770 000002 RTI ;
001771 000000 HALT ;FATAL ERROR, RTI FAILED

001772 162737 000040 001044 KYT4: SUB #40, TSAVE ;CONVERT LC TO UC
001773 005734 BR KYT5 ;
001774 000000 KRBD: D ;

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002116 104000
002120 004537 00546C
002124 001000
002126 005626

002130 104000
002132 004537 00546C
002134 100000
002140 007206

002142 104000
002144 012700 012536
002150 004737 002320
002154 012701 000020
002160 012720 040000
002164 012720 001377
002170 012720 000100
002174 012720 021377
002200 005301
002202 001366
002204 012720 020001
002210 012720 000000
002214 012720 040000
002220 012720 001377
002224 004737 002320
002230 012701 000014
002234 012720 041777
002240 012720 000000
002244 012720 021777
002250 012720 000100
002254 005301
002256 001366
002260 012720 000000
002264 012720 020001
002270 012720 041777
002274 012720 000000
002300 012720 173400
002304 012720 160000
002310 012710 012536
002314 000137 002342

002320 012720 117000
002324 012720 000000
002330 012720 000000
002334 012720 110000
002340 000207

.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 DOP REPEAT FRAME
:EXECUTE PINCUSHION FRAME
FILE2: SCOPE
MOV #BUFFER,RO ;LOAD START ADDRESS
JSR PC,SETPNT ;LOAD D.O ORGIN
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 ?
BNE 15 ;BR IF NOT
MOV #MINUSX+1,(RO)+ ;GO BACK 1 UNIT
MOV #0,(RO)+
MOV #INTX,(RO)+
MOV #MAXY,(RO)+ ;PLOT LAST LINE
JSR PC,SETPNT ;SET ORGIN
MOV #MAXY+1/100,R1 ;SETUP COUNT
25: MOV #INTX+MAXX,(RO)+ ;LOAD DELTA X MAX
MOV #0,(RO)+ ;LOAD DELTA Y = 0
MOV #MINUSX+MAXX,(RO)+ ;RETRACE
MOV #100,(RO)+ ;LOAD DELTA Y OF 100
DEC R1 ;FINISHED ?
BNE 25 ;BR IF NOT
MOV #0,(RO)+
MOV #MINUSX+1,(RO)+ ;PLOT LAST LINE
MOV #INTX+MAXX,(RO)+
MOV #0,(RO)+
MOV #DSTOP,(RO)+ ;LOAD STOP
MOV #DJMP,(RO)+ ;LOAD JUMP
MOV #BUFFER,(RO)
JMP FILE2A

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

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662 0023342 012737 004000 001046 FILE2A: MOV #4000,CNTR :LOAD COUNTER
663 0023350 005737 005624 FILE2B: TST SWITCH :TEST SWITCH
664 0023354 001405 BEQ FILE2C :BR IF SUBTEST NOT SELECTED
665 0023356 004537 005460 JSR R5,MSG :EXIT TO DISPLAY FRAME
666 0023362 000001 |
667 0023364 012536 BUFFER :USING THE CROSS HATCH PATTERN
668 0023366 000404 BR FILE2D :BR
669 0023370 004537 005460 FILE2C: JSR R5,MSG :EXIT TO DISPLAY FRAME
670 0023374 000001 |
671 0023376 007276 FRAME2 :USING THE OFFSET PATTERN
672 0023378 005337 001046 FILE2D: DEC CNTR :FINISHED ?
673 0023380 001361 BNE FILE2B :BR IF NOT
674 :EXECUTE OCTAGONS OR SQUARES
675 0023406 104000 FILE3: SCOPE
676 0023410 012737 014000 001046 MOV #14000,CNTR :SET UP A COUNTER
677 0023416 005737 005624 FILE3A: TST SWITCH :BRANCH IF SUB-TEST
678 0023422 001010 BNE FILE3B :DISPLAY TEST
679 0023424 004537 005460 JSR S,MSG
680 0023430 000001 |
681 0023432 007402 FRAME3 :FRAME # 3
682 0023434 005337 001046 DEC CNTR :DECREMENT COUNTER
683 0023440 001366 BNE FILE3A :BRANCH IF NOT COMPLETE
684 0023442 000407 BR FILE4 :EXIT TO NEXT TEST
685 0023444 004537 005460 FILE3B: JSR S,MSG :DISPLAY TEST
686 0023450 000001 |
687 0023452 007772 FRAME3A :FRAME # 3A
688 0023454 005337 001046 DEC CNTR :DECREMENT COUNTER
689 0023456 001356 BNE FILE3A :BRANCH IF NOT COMPLETE

```

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

FILE4: SCOPE

```

MOV #BUFFER, R0
MOV #STATSB!SIZE0, (0)+
MOV #STATSA!ITALC!SYNOFF!GREEN, (0)+
MOV #POINT!INT4!LPOFF!BLKOFF!LINE0, (0)+ ;LOAD POINT MPDE
MOV #C, (0)+
MOV #MAXY-77, (0)+
MOV #CHAR, (0)+
MOVB #17, (0)+
MOVB #17, (0)+
MOV #100, STCHAR ;LOAD INITIAL CHAR.
JSR PC, LOADBF
MOV #140, STCHAR ;LOAD INITIAL LC CHAR
JSR PC, LOADBF ;LOAD LINE
MOV #40, STCHAR ;LOAD NUMBERS AND PUNCT
JSR PC, LOADBF ;LOAD LINE
MOV #STATSA!ITAL0, (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 #DJMP, (R0)+
MOV #BUFFER, (R0)+
JMP FILE4

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LOADSP: MOVB #16, (R0)+
MOV #0, R2 ;SET INITIAL SHIFT OLT CHAR
MOV #3, R3 ;LOAD COUNT
15: MOVB R2, (R0)+ ;LOAD CHAR
25: INC R2
CMP #17, R2 ;TEST FOR SI
BEQ R3 ;BR IF SI "17"
DEC R3 ;FINISHED ?
BNE 15 ;BR IF NOT
MOV #20017, (R0)+ ;LOAD SHIFT-IN SPACE
RTS PC ;EXIT

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

```

STCHAR: 0

CR LF: MOVB #15, (0)+

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736 002626 012720 012536
737 002626 012720 174400
738 002626 012720 170052
739 002626 012720 117124
740 002626 012720 000000
741 002626 012720 001300
742 002626 012720 100000
743 002626 112720 000017
744 002626 112720 000017
745 002626 004737 000100 002734
746 002626 004737 002672
747 002626 012737 000140 002734
748 002626 004737 002672
749 002626 012737 000040 002734
750 002626 004737 002672
751 002626 012720 170040
752 002626 004737 002632
753 002626 004737 002776
754 002626 012720 170060
755 002626 004737 002632
756 002626 012720 173400
757 002626 012720 160000
758 002626 012720 012536
759 002626 000137 003014
760 002626 112720 000016
761 002626 012702 000000
762 002626 012702 000037
763 002626 110220
764 002626 005202
765 002626 022702 000017
766 002626 001774
767 002626 005303
768 002626 001371
769 002626 012720 020017
770 002626 000207
771 002626 012720 170040
772 002626 013702 002734
773 002626 004737 002760
774 002626 004737 002776
775 002626 012720 170060
776 002626 013702 002734
777 002626 004737 002760
778 002626 004737 002736
779 002626 000207
780 002734 000000
781 002736 112720 000015

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751 002742 112720 000012      MOVB  #12,(0)+
752 002746 112720 000012      MOVB  #12,(0)+
753 002752 112720 000012      MOVB  #12,(0)+
754 002756 000207                RTS    PC          ;EXIT
755
756 002760 012703 000040      FILLIT: MOV  #40,R3
757 002764 110220 000040      FILLA: MOVB  R2,(0)+
758 002766 005202                INC   R2
759 002770 005303                DEC   R3
760 002772 001374                BNE  FILLA
761 002774 000207                RTS    7
762
763 002776 012703 000010      SPACE: MOV  #10,R3
764 003002 112720 000040      IS:   MOVB  #40,(R0)+ ;LOAD A SPACE
765 003006 005303                DEC   R3
766 003010 001374                BNE  IS          ;BR IF NOT DONE
767 003012 000207                RTS    PC          ;EXIT
768
769                ;ACTUAL DISPLAY ROUTINE
770
771 003014 012737 001000 003070  FILE4A: MOV  #1000,10$ ;LOAD A COUNTER
772 003022 012737 001300 012546  4$:   MOV  #MAXY-77,BUFFER+10 ;LOAD STARTING POINT
773 003030 004537 005460                JSR  R5,MSG
774 003034 000001                I
775 003036 012536                BUFFER
776
777 003040 012737 000400 012546  MOV  #400,BUFFER+10
778 003046 004537 005460  JSR  R5,MSG
779 003052 000001                I
780 003054 012536                BUFFER
781
782 003056 005337 003070                DEC  10$ ;FINISHED ?
783 003062 001357                BNE  4$ ;BR IF NOT
784 003064 000137 003072                JMP  FILES ;GO TO NEXT TEST
785
786 003070 000000      10$:  0
787
788                ;EXECUTE DASH LINES AND BLINK
789
790 003072 104000      FILES: SCOPE
791 003074 004537 005460  JSR  5,MSG ;EXIT TO DISPLAY A FRAME
792 003100 010000                10000
793 003102 010242                FRMES ;USING THE DASH AND BLINK FRAME
  
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;EXECUTE VECTOR LENGTH TEST <HORIZ>

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FILE6: SCOPE
MOV #INTX,MAXY,DELTX6 ;SET UP VERTICAL HEIGHT
MOV #10,DSAVE2 ;SET UP TIMER
MOV #0,DSAVE1
LOOPA: MOV #40,CNTR ;SET UP EXECUTION COUNT
LOOPA1: MOV #MAXY+1/10,DSAVE ;SET UP
MOV DSAVE1,DELTY6
JSR 5,MESG ;EXIT TO DISPLAY FRAME
|
| FRME6 ;VECTOR LENGTH FRAME
| JSR 5,MESG ;EXIT TO DISPLAY FRAME
|
| FRME6A ;VECTOR LENGTH FRAME
ADD #10,DELTY6 ;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
  
```

;EXECUTE VECTOR LENGTH TEST <VERT>

```

FILE7: SCOPE
MOV #INTX,DSAVE1 ;SETUP INITIAL X
MOV #MAXY,DELTY6 ;SETUP INITIAL Y
MOV #10,DSAVE2 ;SETUP EXECUTION COUNT
LOOPB: MOV #40,CNTR ;SETUP DELAY
LOOPB1: MOV #200,DSAVE
MOV DSAVE1,DELTX6 ;EXIT TO DISPLAY FRAME
JSR 5,MESG ;VECTOR LENGTH TEST FRAME
|
| FRME6 ;EXIT TO DISPLAY FRAME
| JSR 5,MESG
|
| FRME6A ;VECTOR LENGTH FRAME
ADD #10,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
  
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051 003370 104000
052 003372 005037 010554
053 003376 004537 005460
054 003402 000050
055 003404 010552
056 003406 004537 005460
057 003412 000001
058 003414 010652
059 003416 000240
060 003420 005737 005624
061 003424 001364
062 003426 062737 000001 010554 D7C:
063 003434 022737 002000 010554
064 003442 001355
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069 003444 104000
070 003446 005037 010616
071 003452 004537 005460
072 003456 000050
073 003460 010612
074 003462 004537 005460
075 003466 000001
076 003470 010652
077 003472 000240
078 003474 005737 005624
079 003500 001364
080 003502 062737 000001 010616 D7F:
081 003510 022737 001400 010616
082 003516 001355

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:PHOSPHOR TEST (HORIZONTAL)

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FILE10: SCOPE
D7A: CLR DELTX7
JSR 5,MESG ;EXIT TO DISPLAY A FRAME
SO
FRME10 ;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
FRME11 ;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

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883
884           ;INTENSITY LEVEL TEST
885
886 003520 104000 FILE12: SCOPE
887 003522 012777 003616 175340 MOV #RETLP, @LPVCT ;SET UP LIGHT-PEN VECTOR
888 003530 013777 001004 175334 MOV GSBRL, @LPVCT1 ;SET UP BR LEVEL
889 003536 012737 004000 001032 MOV #4000, DSAVE ;SET UP A EXECUTION COUNT
890 003544 005737 005624 FLE12A: TST SWITCH ;TEST THE "SWITCH"
891 003550 001004 BNE FLE12B ;BR IF SET "SYNC"
892 003552 042737 000004 010716 BIC #4, SYN12 ;ENSURE CLEAR "SYNC"
893 003560 000403 BR FLE12C ;BY PASS
894 003562 052737 000004 010716 FLE12B: BIS #4, SYN12 ;SET THE "SYNC"
895 003570 004537 005460 FLE12C: JSR 5, MMSG ;EXIT TO DISPLAY FRAME
896 003574 000001
897 003576 010710 FRME12 ;USING THE "INTENSITY" FRAME
898 003600 005337 001032 DEC DSAVE ;FINISHED?
899 003604 001423 BEQ FLE12D ;YES, EXIT
900 003606 012737 173400 011316 MOV #DSTOP, RAYLPA ;NO, RESET MESSAGE
901 003614 000753 BR FLE12A ;BR BACK
902 003616 012737 164000 011316 RETLP: MOV #DNOP, RAYLPA ;LIGHT-PEN HIT
903 003624 017737 175232 011330 MOV @YPOS, LPPNT ;READ Y POSITION
904 003632 042737 176000 011330 BIC #176000, LPPNT ;MASK THE BITS
905 003640 022626 CMP (SP)+, (SP)+ ;POP THE STACK
906 003642 012777 000001 175204 MOV #1, @DPC ;SINGLE STEP THE DISPLAY
907 003650 000137 005476 JMP MMSG ;JUMP TO WAIT
908 003654 013777 001072 175206 FLE12D: MOV LPVCT1, @LPVCT ;RESET THE LIGHT-PEN VECTOR
909
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914           ;EXECUTE EDGE TEST
915
916 003662 104000 FILE13: SCOPE
917 003664 004537 005460 JSR 5, MMSG ;EXIT TO DISPLAY FRAME
918 003670 010000
919 003672 011360 FRME13 ;USING THE "EDGE" FRAME

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:SHORT VECTOR AND RELATIVE POINT TEST

FILE14: SCOPE

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003674 104000
003676 012700 012536
003702 012720 114000
003706 012720 000240
003712 012720 000600
003716 012720 107004
003722 004737 003754
003726 012720 130000
003732 004737 003754
003736 012720 173400
003742 012720 160000
003746 012720 012536
003752 000413

003754 012737 000024 001046
003762 012720 040077
003766 012720 004177
003772 005337 001046
003776 001371
004000 000207

004002 012737 004000 004152
004010 012737 000200 011640
004016 012737 000200 011642
004024 004537 005460
004030 000001
004032 011634
004034 012737 001400 011640
004042 012737 000200 011642
004050 004537 005460
004054 000001
004056 011634
004060 012737 001400 011640
004066 012737 001000 011642
004074 004537 005460
004100 000001
004102 011634
004104 012737 000200 011640
004112 012737 001000 011642
004120 004537 005460
004124 000001
004126 011634
004130 004537 005460
004134 000001
004136 012536
004140 005337 004152
004144 001321
004146 000137 004154
004152 000000

MOV #BUFFER, R0 ;SET UP R0
MOV #POINT, (0)+ ;SET UP INITIAL
MOV #240, (0)+ ;X POSITION
MOV #MAXY+1/2, (0)+ ;Y POSITION
MOV #SHORTV!INT4!LINE0, (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

_CADVT: 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

FILE14A: MOV #4000, 105 ;LOAD COUNTER
IS: MOV #200, FRM14A ;LOAD FIRST OCTAGON
MOV #200, FRM14B
JSR R5, MMSG ;DISPLAY OCT.
1
FRME14
MOV #1400, FRM14A ;LOAD SECOND OCTAGON
MOV #200, FRM14B
JSR R5, MMSG ;DISPLAY 2ND OCT.
1
FRME14
MOV #1400, FRM14A ;LOAD THIRD OCTAGON
MOV #MAXY-377, FRM14B
JSR R5, MMSG
1
FRME14
MOV #200, FRM14A ;LOAD FOURTH OCTAGON
MOV #MAXY-377, FRM14B
JSR R5, MMSG ;DISPLAY 4TH OCT.
1
FRME14
JSR R5, MMSG ;DISPLAY BAR
1
BUFFER
DEC 105 ;FINISHED ?
BNE IS ;BR IF NOT
JMP FILE15 ;NEXT TEST
0

105:


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;GRAPHLOT X-Y TEST
FILE15: SCOPE
MOV #BUFFER, R0 ;LOAD R0
MCV #POINT!INT7, (0)+ ;LOAD INITIAL POINT
MOV #0, (0)+
MOV #0, (0)+
MOV #STATSA!ITALD!SYNOFF!GREEN, (R0)+ ;RESET THE STATUS A
MOV #STATSB!INCR, (0)+ ;LOAD INITIAL STATUS B
MOV #GRAPHX, (0)+ ;LOAD GRAPH X INST
DFL15C: MOV #40, R5 ;LOAD STARTUP COUNT
MOV #0, DSAVE ;LOAD INITIAL PLOT
BR 25
15: ADD #20, DSAVE ;UPDATE PLOT POINT
25: MOV DSAVE, (0)+ ;SAVE THE POINT
DEC R5 ;FINISHED?
BNE 15 ;BR IF NOT
MOV #DSTOP, (0)+ ;LOAD "DSTOP"
MOV #DJMP, (0)+ ;LOAD "DJMP"
MOV #BUFFER, (0)+ ;LOAD RETURN
MOV #200, DSAVE ;LOAD POINT COUNT
DFL15D: BIC #4000, DDBUF5 ;ENSURE "GRAPHX"
TST SWITCH ;TEST SWITCH
BEQ DFL15B ;BR IF GRAPHX
BIS #4000, DDBUF5 ;SET GRAPHY
DFL15B: JSR 5, MESC ;EXIT TO DISPLAY A FRAME
1
BUFFER ;USING THE GENERATED PATTERN
ADD #1, DDBUF4 ;UPDATE INCREMENT
CMP #STATSB+200, DDBUF4 ;TEST IF LAST INCREMENT
BNE DFL15B ;BR IF NOT
MOV #STATSB!INCR, DDBUF4 ;RELOAD 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
HERE: JMP FILE0
NOP
NOP
NOP

```

```

1019
1020 ;OPERATOR OPERATOR INTERVENTION TESTS
1021
1022 FILE16: SCOPE
1023 004410 104000
1024 004412 012777 004662 174450 MOV #RET14,ALPVCT
1025 004420 013777 001004 174444 MOV GSBRL,ALPVCT1
1026 004426 012737 000100 001034 MOV #100,DSAVE1 ;SET UP COUNT
1027 004434 012700 012536 1S: MOV #BUFFER,RO ;LOAD START ADDR.
1028 004440 012737 000100 001032 MOV #100,DSAVE
1029 004446 012720 117744 MOV #POINT!INT7!LPON!LINED,(RO)+ ;LOAD POINT
1030 004452 012720 000700 MOV #700,(RO)+ ;LOAD X POINT
1031 004456 012720 000474 MOV #474,(RO)+ ;LOAD Y POINT
1032 004462 004737 004624 JSR PC,LOADUP ;LOAD UP THE BUFFER
1033 004466 012720 173400 MOV #DSTOP,(RO)+ ;LOAD DSTOP
1034 004472 012720 160000 MOV #DJMP,(RO)+ ;LOAD DJUMP
1035 004476 012720 012536 MOV #BUFFER,(RO)+ ;LOAD RETURN ADDRESS
1036 004502 005037 005116 CLR HITCNT ;CLEAR HIT COUNT
1037 004506 012737 030060 012442 MOV #30060,FRM16B-2 ;PRESET THE READOUT
1038 004514 012737 030060 012440 MOV #30060,FRM16B-4
1039
1040 004522 005737 005624 4S: TST SWITCH ;TEST SWITCH BIT
1041 004526 001005 BNE 6S ;BR IF SUBTEST
1042
1043 004530 004537 005460 JSR R5,MSG ;EXIT TO DISPLAY FRAME
1044 004534 000100 100 ;USINT THE LIGHT-PEN FRAME
1045 004536 011762 FRM16 ;BR BACK
1046 004540 000770 BR 4S
1047
1048 004542 004537 005460 6S: JSR R5,MSG ;EXIT TO DISPLAY FRAME
1049 004546 000001 1 ;ASCII SUBTITLE
1050 004550 012350 FRM16A
1051
1052 004552 004537 005460 JSR R5,MSG ;EXIT TO DISPLAY FRAME
1053 004556 000001 1 BUFFER
1054
1055 004562 005337 001032 DEC DSAVE ;FINISHED ?
1056 004566 001355 BNE 4S ;BR IF NOT MINI-LOOP
1057
1058 004570 005337 001034 DEC DSAVE1 ;FINISHED ?
1059 004574 001317 BNE 1S ;BR IF NOT
1060 004576 000137 004410 JMP FILE16 ;RESTART

```



```

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

```


Hexadecimal address column containing various values such as 000000, 000002, 000004, 000006, etc., up to 00000C.

:UPDATE OCTAL READOUT

ABCHR: BIC #176000,R3
JSR PC,105
MOVB R4, -(R2) :LOAD R4 :SAVE BITS
JSR PC,115 :MOVEMENT :SAVE BITS
MOVB R4, -(R2) :MOVEMENT :SAVE BITS
JSR PC,115 :MOVEMENT :SAVE BITS
MOVB R4, -(R2) :SAVE BITS
JSR PC,115 :MOVEMENT :SAVE BITS
MOVB R4, -(R2) :SAVE BITS
RTS PC
:15: ROR R3
ROR R3
ROR R3
:05: MOV R3,R4 :LOAD R4
BIC #177770,R4 :MASK BITS
ADD #60,R4 :MAKE A NUMBER
RTS PC
MSG: MOV (5)+,COUNT
MOV (5)+,FILE
MOV FILE,JDPC :START DISPLAY
MSGA: CLR @PSW
WAIT
TST KRBD
BNE MSGAB
DEC COUNT
BEQ MSGB :SINGLE STEP THE DISPLAY
MOV @1,@DPC
JMP MSGA
MSGB: NOP
TST KRBD
BNE MSGBA
CLR SWITCH
BIT @BIT6,@SWR
BEQ MSGBA
COB SWITCH
MSGBA: RTS
MSGAB: TST SWITCH
BNE MSGAB
TST CHANGE
BEQ MSGAB
CLR CHANGE
CLR SWITCH
CLR HOLD
JMP SCOPEC
COUNT: 0
FILE: 0
SWITCH: 0

E03

006698 0332460 0336440 043040
006699 0336440 042040 051501
006700 020110 044514 042516
006701 020123 047101 020104
006702 046102 047111 113
006703 015 012
006704 020066 020075
006705 020107 020075 047510
006706 044522 047532 052116
006707 046101 050040 041505
006708 047524 020122 047101
006709 046107 020105 040474
006710 045107 020056 020130
006711 045526 051103 051117
006712 046040 047105 052107
006713 037110 015 012
006714 0332460 0336440 044040
006715 0336440 053040 051105
006716 047524 040503 020114
006717 042526 052103 051117
006718 040474 047516 040474
006719 020101 042516 020112
006720 050040 050040 051505
006721 020122 040474 076
006722 043516 044124 015
006723 015 012
006724 020060 020075
006725 020075 047510
006726 044522 047532 052116
006727 046101 050040 047510
006728 050123 047510 020122
006729 042524 052123
006730 015 012
006731 0332461 0336440 045040
006732 0336440 052040 051105
006733 044524 040503 020114
006734 044120 051517 044120
006735 051117 052040 051505
006736 124
006737 015 012
006738 020062 020075
006739 020113 020075 047111
006740 042524 051516 052111
006741 020131 042514 042526
006742 020114 047101 020104
006743 044514 044107 026524
006744 042520 020116 042524
006745 052123
006746 015 012
006747 031461 0336440 046040
006748 0336440 042440 043504
006749 020105 046106 043501
006750 052040 051505 124
006751 015 012
006752 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/

```

1345 006672 020115 020075 044123
1346 006730 051117 020124 042526
1347 006796 052103 051117 020123
1348 006714 047101 020104 042522
1349 006722 040514 044524 042526
1350 006730 050040 044517 052116
1351 006736 015 012
1352 006740 032461 036440 047040
1353 006746 036440 043440 040522
1354 006754 044120 046120 052117
1355 006762 052040 051505 124
1356 006767 015 012
1357 006771 061 020066 020075
1358 006776 020117 020075 044514
1359 007004 044107 020124 042520
1360 007012 020116 047506 046114
1361 007020 053517
1362 007022 015 012
1363 007024 033461 036440 050040
1364 007032 036440 045440 054505
1365 007040 047502 051101 020104
1366 007046 041505 047510 052040
1367 007054 051505 124
1368 007057 015 012
1369 007062 020040 052522 047502
1370 007070 052125 052040 020117
1371 007076 042522 040515 047111
1372 007104 047440 020116 044124
1373 007112 020105 040520 052124
1374 007120 051105 116
1375 007123 015 012
1376 007125 040 041440 020122
1377 007132 047524 051440 046105
1378 007140 041505 020124 052523
1379 007146 026502 044520 052103
1380 007154 051125 020105 051117
1381 007162 051440 047524 020120
1382 007170 047515 044524 047117
1383 007176 000040
1384
1385 007200 173400 .EVEN
1386 007202 160000 DSTOP
1387 007204 005626 CJMP
1388 FRME0
1389
1390 007206 FRME1:
1391 007206 170052 STATSA!ITALO!SYNOFF!GREEN
1392 007210 116124 POINT!INTO!LPOFF!BLKOFF!LINE0
1393 007212 041000 INTX+1000
1394 007214 000600 MAXY+1/2
1395 007216 040000 INTX+0
1396 007220 000000 0
1397 007222 041000 INTX+1000
1398 007224 000600 MAXY+1/2
1399 007226 041777 INTX+1777
1400 007230 000000 0
1401 007232 041000 INTX+1000

```

.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 /

```

140 007234 000600
141 007236 041777
142 007240 001377
143 007242 041000
144 007244 000600
145 007246 040000
146 007250 001377
147 007252 164000
148 007254 164000
149 007256 164000
150 007260 164000
151 007262 164000
152 007264 164000
153 007266 164000
154 007270 173400
155 007272 160000
156 007274 007206

```

```

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

```

:FILE 2 (ANALOG TUNE-UP TEST)

```

157 007276 116524
158 007300 000000
159 007302 000000
160 007304 173400
161 007306 100000
162 007310 041777
163 007312 000000
164 007314 040000
165 007316 001377
166 007320 061777
167 007322 000000
168 007324 040000
169 007326 021377
170 007330 041777
171 007332 020000
172 007334 060000
173 007336 001377
174 007340 061777
175 007342 020000
176 007344 060000
177 007346 021377
178 007350 041777
179 007352 001377
180 007354 061777
181 007356 021377
182 007360 001777
183 007362 000000
184 007364 061777
185 007366 001377
186 007370 041777
187 007372 021377
188 007374 173400
189 007376 160000
190 007400 007276

```

```

FRAME2: POINT!INT2!LPOFF!BLKOFF!LINED
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
FRAME2

```

: OCTAGONS

H03

```

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

```

FRME3: POINT!INT4!LPOFF!BLKOFF!LINED

```

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


```

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

```

:OCTOGON BY LENGTH OF 77

:OCTOGON BY LENGTH OF 177

:OCTOGON BY LENGTH OF 377

```

1569 007740 060377
1570 007742 000377
1571 007744 060377
1572 007746 000000
1573 007750 060377
1574 007752 020377
1575 007754 040000
1576 007756 020377
1577 007760 040377
1578 007762 020377
1579 007764 173400
1580 007766 160000
1581 007770 007402
1584 007772 117124
1585 007774 001000
1586 007776 000600
1587 010000 170052
1588 000007
1589 000004
1590 010002 110000
1591 010004 040007
1592 010006 000000
1593 010010 040000
1594 010012 000007
1595 010014 060007
1596 010016 000000
1597 010020 040000
1598 010022 020007
1599 010024 020004
1600 010026 020004
1601 .LIST
1602 010030 110000
1603 010032 040017
1604 010034 000000
1605 010036 040000
1606 010040 000017
1607 010042 060017
1608 010044 000000
1609 010046 040000
1610 010050 020017
1611 010052 020007
1612 010054 020007
1613 .LIST
1614 010056 110000
1615 010060 040037
1616 010062 000000
1617 010064 040000
1618 010066 000037
1619 010070 060037
1620 010072 000000
1621 010074 040000
1622 010076 020037
1623 010100 020017
1624 010102 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!ITALO!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

```

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

.LIST
LONGV ;BY 77 AND 37
INTX+77
0
INTX
77
INTX!MINUSX+77
0
INTX
MINUSX+77
MINUSX+37
MINUSX+37
.LIST
LONGV ;BY 177 AND 77
INTX+177
0
INTX
177
INTX!MINUSX+177
0
INTX
MINUSX+177
MINUSX+77
MINUSX+77
.LIST
LONGV ;BY 377 AND 177
INTX+377
0
INTX
377
INTX!MINUSX+377
0
INTX
MINUSX+377
MINUSX+177
MINUSX+177
.LIST
LONGV ;BY 777 AND 377
INTX+777
0
INTX
777
INTX!MINUSX+777
0
INTX
MINUSX+777
MINUSX+377
MINUSX+377
.LIST
DSTOP
DJMP
FRME3A
;DASH LINE TEST
FRME5: PCINT!INT4

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

1737 010462 000000
 1738 010464 000000
 1739 010466 173400
 1740 010470 160000
 1741 010472 010242
 1742
 1743
 1744
 1745 010474 114000
 1746 010476 001777
 1747 010500 000000
 1748 010502 170052
 1749 010504 113724
 1750 010506 040000
 1751 010510 001377
 1752 010512 114000
 1753 010514 000000
 1754 010516 001377
 1755 010520 110000
 1756 010522 041777
 1757 010524 000000
 1758 010526 173400
 1759 010530 114000
 1760 010532 000000
 1761 010534 000000
 1762 010536 110000
 1763 010540 000000
 1764 010542 000000
 1765 010544 173400
 1766 010546 160000
 1767 010550 010530
 1768
 1769
 1770
 1771
 1772 010552 114000
 1773 010554 000000
 1774 010556 000000
 1775 010560 170052
 1776 010562 113724
 1777 010564 040000
 1778 010566 001377
 1779 010570 000002
 1780 010572 000000
 1781 010574 040000
 1782 010576 021377
 1783 010600 000002
 1784 010602 000000
 1785 010604 173400
 1786 010606 160000
 1787 010610 010562
 1788
 1789
 1790
 1791 010612 114000
 1792 010614 000000

0
 0
 DSTOP
 DJMP
 FRM5

 ;VECTOR LENGTH TEST <FILE 6 AND 7>
 FRM6: POINT
 MAXX
 0
 STATSA!ITALO!SYNOFF!GREEN
 LONGV!INT7!LPOFF!BLKOFF!LINE0
 INTX
 MAXY
 POINT
 0
 MAXY
 LONGV
 INTX!MAXX
 0
 DSTOP
 FRM6A: POINT
 0
 0
 LONGV
 DELTX6: 0
 DELTY6: 0
 DSTOP
 DJMP
 FRM6A

 ;PHOSPHOR TEST
 FRM10: POINT
 DELTX7: 0
 0
 STATSA!ITALO!SYNOFF!GREEN
 DFI10A: LONGV!INT7!LPOFF!BLKOFF!LINE0
 INTX
 MAXY
 2
 0
 INTX
 MINUSY!MAXY
 2
 0
 DSTOP
 DJMP
 DFI10A

 ;PHOSPHOR TEST
 FRM11: POINT
 0

1793 010616 000000
 1794 010620 170052
 1795 010622 113724
 1796 010624 041777
 1797 010626 000000
 1798 010630 000000
 1799 010632 000002
 1800 010634 061777
 1801 010636 000000
 1802 010640 000000
 1803 010642 000002
 1804 010644 173400
 1805 010646 160000
 1806 010650 010622
 1807
 1808
 1809 010652 117604
 1810 010654 000000
 1811 010656 000000
 1812 010660 110000
 1813 010662 041777
 1814 010664 000000
 1815 010666 040000
 1816 010670 001377
 1817 010672 061777
 1818 010674 000000
 1819 010676 040000
 1820 010700 021377
 1821 010702 173400
 1822 010704 160000
 1823 010706 010652
 1824
 1825
 1826 010710 114164
 1827 010712 000000
 1828 010714 001200
 1829 010716 170252
 1830 010720 103600
 1831 010722 017
 1832 010724 047111
 1833 010732 052111
 1834 010740 020040
 1835 010742 110000
 1836 010744 041000
 1837 010746 000000
 1838 010750 130000
 1839 010752 057600
 1840 010754 103400
 1841 010756 015
 1842 010761 012
 1843 010762 047111
 1844 010770 052111
 1845 010776 020040
 1846 011000 110000
 1847 011002 041000
 1848 011004 000000

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!LPOFF!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

```

1894 011100 130000
1895 011101 057600
1896 011102 103200
1897 011103 015 012
1898 011104 015 012
1899 011105 047111 042524 051516
1900 011106 052111 020131 020065
1901 011107 020040
1902 011108 110000
1903 011109 041000
1904 011110 000000
1905 011111 130000
1906 011112 057600
1907 011113 102600
1908 011114 015 012
1909 011115 015 012
1910 011116 047111 042524 051516
1911 011117 052111 020131 020064
1912 011118 020040
1913 011119 110000
1914 011120 041000
1915 011121 000000
1916 011122 130000
1917 011123 057600
1918 011124 102400
1919 011125 015 012
1920 011126 015 012
1921 011127 047111 042524 051516
1922 011128 052111 020131 020062
1923 011129 020040
1924 011130 110000
1925 011131 041000
1926 011132 000000
1927 011133 130000
1928 011134 057600
1929 011135 102200
1930 011136 015 012
1931 011137 015 012
1932 011138 047111 042524 051516
1933 011139 052111 020131 020061
1934 011140 020040
1935 011141 110000
1936 011142 041000
1937 011143 000000
1938 011144 130000
1939 011145 057600
1940 011146 102200
1941 011147 015 012
1942 011148 015 012
1943 011149 047111 042524 051516
1944 011150 052111 020131 020061
1945 011151 020040
1946 011152 110000
1947 011153 041000
1948 011154 000000
1949 011155 130000
1950 011156 057600
1951 011157 102200
1952 011158 015 012
1953 011159 015 012
1954 011160 047111 042524 051516
1955 011161 052111 020131 020061
1956 011162 020040
1957 011163 110000
1958 011164 041000
1959 011165 000000
1960 011166 130000
1961 011167 057600
1962 011168 102200
1963 011169 015 012
1964 011170 015 012
1965 011171 047111 042524 051516
1966 011172 052111 020131 020061
1967 011173 020040
1968 011174 110000
1969 011175 041000
1970 011176 000000
1971 011177 130000
1972 011178 057600
1973 011179 102600
1974 011180 015 012
1975 011181 015 012
1976 011182 047111 042524 051516
1977 011183 052111 020131 020063
1978 011184 020040
1979 011185 110000
1980 011186 041000
1981 011187 000000
1982 011188 130000
1983 011189 057600
1984 011190 102400
1985 011191 015 012
1986 011192 015 012
1987 011193 047111 042524 051516
1988 011194 052111 020131 020062
1989 011195 020040
1990 011196 110000
1991 011197 041000
1992 011198 000000
1993 011199 130000
1994 011200 057600
1995 011201 102200
1996 011202 015 012
1997 011203 015 012
1998 011204 047111 042524 051516
1999 011205 052111 020131 020061
2000 011206 020040
2001 011207 110000
2002 011208 041000
2003 011209 000000
2004 011210 130000
2005 011211 057600
2006 011212 102200
2007 011213 015 012
2008 011214 015 012
2009 011215 047111 042524 051516
2010 011216 052111 020131 020061
2011 011217 020040
2012 011218 110000
2013 011219 041000
2014 011220 000000
2015 011221 130000

```

```

RELATV
57600
CHAR!INT5
.BYTE 15,12,12,12
012 012
.ASCII /INTENSITY 5
LONGV
41000
0
RELATV
57600
CHAR!INT4
.BYTE 15,12,12,12
012 012
.ASCII /INTENSITY 4
LONGV
41000
0
RELATV
57600
CHAR!INT3
.BYTE 15,12,12,12
012 012
.ASCII /INTENSITY 3
LONGV
41000
0
RELATV
57600
CHAR!INT2
.BYTE 15,12,12,12
012 012
.ASCII /INTENSITY 2
LONGV
41000
0
RELATV
57600
CHAR!INT1
.BYTE 15,12,12,12
012 012
.ASCII /INTENSITY 1
LONGV
41000
0
RELATV

```


E04

GT-40 GT-44 WITH VR14 VISUAL DISPLAY TEST MAINDEC-11-DDGTC-C
DDGTC.P11 15-SEP-76 00:00

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00000000000000000000000000000000	C11604	110000
00000000000000000000000000000000	011606	020012
00000000000000000000000000000000	011610	000000
00000000000000000000000000000000	011612	100000
00000000000000000000000000000000	011614	040
00000000000000000000000000000000	011616	164000
00000000000000000000000000000000	011620	164000
00000000000000000000000000000000	011622	173400
00000000000000000000000000000000	011624	164000
00000000000000000000000000000000	011626	164000
00000000000000000000000000000000	011628	160000
00000000000000000000000000000000	011630	011360

102

LONGV
MINUSX+12
0
CHAR
.BYTE 40.102 ;"SPACE" AND AN "B"
DNOP
DNOP
DSTOP
DNOP
DNOP
DJMP
FRME13

2030
 2031
 2032 011634 170052
 2033 011636 117124
 2034 011640 000000
 2035 011642 000000
 2036 011644 104000
 2037 011646 056200
 2038 011650 056271
 2039 011652 040071
 2040 011654 076271
 2041 011656 076200
 2042 011660 076371
 2043 011662 040171
 2044 011664 056371
 2045 011666 020504
 2046 011670 164000
 2047 011672 164000
 2048 011674 130000
 2049 011676 057000
 2050 011700 057074
 2051 011702 040074
 2052 011704 077074
 2053 011706 077000
 2054 011710 077174
 2055 011712 040174
 2056 011714 057174
 2057 011716 020504
 2058 011720 164000
 2059 011722 164000
 2060 011724 104000
 2061 011726 057600
 2062 011730 057677
 2063 011732 040077
 2064 011734 077677
 2065 011736 077600
 2066 011740 077777
 2067 011742 040177
 2068 011744 057777
 2069 011746 020504
 2070 011750 164000
 2071 011752 164000
 2072 011754 173400
 2073 011756 160000
 2074 011760 011634

FRME14: STATSA!ITALD!SYNOFF!GREEN
 POINT!INT4!BLKOFF!LPOFF!LINE0
 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
 RE_ATV
 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
 CSTOP
 OJMP
 FRME14

2075					
2076	011762	117724			
2077	011764	000000			
2078	011766	001200			
2079	011770	170052			
2080	011772	100000			
2081	011774	017	017		
2082	011776	044514	044107	020124	
2083	012004	042520	020116	047506	
2084	012012	046114	053517	052040	
2085	012020	051505	020124		
2086	012024	015	012	012	
2087	012027	130	020075		
2088	012032	030061	030060		
2089	012036	015	012	012	
2090	012041	131	020075		
2091	012044	033060	030060		
2092	012050	114140			
2093	012052	001000			
2094	012054	000600			
2095	012056	164000			
2096	012060	164000			
2097	012062	130000			
2098	012064	074000			
2099	012066	041000			
2100	012070	041000			
2101	012072	041000			
2102	012074	041000			
2103	012076	041000			
2104	012100	041000			
2105	012102	041000			
2106	012104	041000			
2107	012106	041000			
2108	012110	041000			
2109	012112	041000			
2110	012114	041000			
2111	012116	041000			
2112	012120	041000			
2113	012122	041000			
2114	012124	041000			
2115	012126	041000			
2116	012130	041000			
2117	012132	041000			
2118	012134	041000			
2119	012136	041000			
2120	012140	041000			
2121	012142	041000			
2122	012144	041000			
2123	012146	164000			
2124	012150	164000			
2125	012152	164000			
2126	012154	164000			
2127	012156	164000			
2128	012160	164000			
2129	012162	164000			
2130	012164	164000			

FRME16: POINT!INT7!LPOFF!BLKOFF!LINE0

0
MAXY-177
STATSA!ITALO!SYNOFF!GREEN
CHAR
.BYTE 17,17
.ASCII /LIGHT PEN FOLLOW TEST /

DLT14A: .ASCII /X= /

.BYTE 15,12,12

DLT14B: .ASCII /Y= /

.ASCII /1000/
.BYTE 15,12,12

RAY14A: 1000

RAY14B: 600

DNOP

DNOP

RELATV

TAB16A: INTX!MINUSX+14000

INTX+1000

INTX+1000

INTX+1000

INTX+1000

INTX+1000

INTX+1000

INTX+1000

INTX+1000

INTX+1000

INTX+1000

INTX+1000

INTX+1000

INTX+1000

INTX+1000

INTX+1000

INTX+1000

INTX+1000

DNOP

DNOP

DNOP

DNOP

DNOP

DNOP

DNOP


```

012346 011762
012350 117724
012352 000000
012354 001200
012356 170052
012360 100000
012362 017 017
012364 044514 044107 020124
012372 042520 020116 044506
012400 046105 020104 043117
012406 053040 042511 020127
012414 015 012 012
012417 116 046525 042502
012424 020122 043117 044040
012432 052111 020123 020075
012440 030060 030060
012444 173400
012446 160000
012450 012350
012452 114124
012454 000000
012456 001200
012460 170052
012462 103000
012464 017 017
012466 042513 041131 040517
012474 042122 042440 044103
012502 020117 042524 052123
012510 000
012511 015 012 012
012514 044103 051101 047440
012522 052103 036440 040
012527 000 000 000
012532 000
012533 015 012 012
012536 164000
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
.ASCII /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

BT	0033502	879*							
BTCH01	005126	1136*	1138						
BTCH02	005364	1177*	1177*						
BTCH03	005234	1155*	1155	1176	1179				
BTCH04	000004	548	548	549*	556*				
BTCH05	005622	1204*	1205	1231*					
BTCH06	002116	468	542	612*	1015				
BTCH07	002130	469	619*						
BTCH08	003370	476	851*						
BTCH09	003444	477	868*						
BTCH10	003520	478	886*						
BTCH11	003662	479	913*						
BTCH12	003674	480	920*						
BTCH13	004154	481	967	973*					
BTCH14	004410	482	1022*	1061					
BTCH15	005120	483	1134*	1167					
BTCH16	002142	470	626*						
BTCH17	002342	655	663*						
BTCH18	002350	664*	675						
BTCH19	002370	665	671*						
BTCH20	002400	669	674*						
BTCH21	002406	471	679*						
BTCH22	002416	681*	687	694					
BTCH23	002444	682*	690*	700*					
BTCH24	002462	472	688	700*					
BTCH25	003014	724	771*	790*					
BTCH26	003072	473	784	790*					
BTCH27	003104	474	797*						
BTCH28	003236	475	824*						
BTLA	002764	757*	760						
BTLIT	002760	740	744	756*					
BTL14A	004032	932	941*						
BTL12A	003544	890*	901						
BTL12B	003562	891	894*						
BTL12C	003570	893	895*						
BTL12D	003654	899	908*						
BTM0	005626	615	1224*	1387					
BTM1	007206	622	1369*	1417					
BTM10	010552	855	1772*						
BTM11	010612	872	1791*						
BTM12	010710	897	1826*	1939					
BTM13	011360	916	1943*	2028					
BTM14	011634	946	951	956	961	2032*	2074		
BTM16	011762	1044	2076*	2187					
BTM17	012452	1152	2208*						
BTM2	007276	673	1421*	1454					
BTM3	007402	685	1458*	1581					
BTM3A	007772	692	1584*	1676					
BTM5	010242	793	1680*	1741					
BTM6	010474	806	833	1745*					
BTM6A	010530	809	836	1759*	1767				
BTM10	010652	858	875	1809*	1822				
BTM14A	011640	942*	947*	952*	957*	2034*			
BTM14B	011642	943*	948*	953*	958*	2035*			
BTM16A	012350	1049	2169*	2206					
BTM16B	012444	1036*	1037*	1089	2204*				

1147*								
580*	581	584*	586	588	593	605*		
393*	397*	400*	572					

