

# POINTER LITE PEN



BY INTERACTIVE  

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GRAPHICS

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OPERATOR'S  
MANUAL



## POINTER SOFTWARE

The driver for pointer is an M/L subroutine residing in under one page of memory, \$0300 to \$03EB. The driver performs the following functions:

1. Selects Graphics mode.
2. Selects Page two display.
3. Binary coded search for Y ordinate.
4. Binary coded search for X ordinate.
5. Tests for odd/even Y ordinate.
6. Sets page one display.
7. Returns to calling program.

Conditions on return:

1. All registers clobbered.
2. GABSL/GABSH contain Page two base address of pen location.
3. X ordinate in location \$001F (dec 31).
4. Y ordinate in location \$001E (dec 30).

Memory utilization.

LOCATION		FUNCTION
HEX	DEC	
\$0019-\$001F	26-31	Driver temps and saved data
\$0300-\$03EB	768-1003	Driver routine
\$0800-\$0BFF	2048-3071	Page two search area.

Driver address and function table:

Temps

\$0019 INDX Driver working register  
 \$001A HUE " " "  
 \$001B LOW " " "  
 \$001C HIGH " " "  
 \$001D FLAG Value zero on pen found, \$FF not found.  
 \$001E Computed value of Y ordinate.  
 \$001F " " " X "

Driver

\$0300 FIND Main entry point for Pointer. All registers clobbered.  
 \$1B+FIND POLP Test for illumination of pen tip. Returns A reg and FLAG: =0 on light, =\$FF on dark. This routine polls location \$C061 for a maximum of 17 ms. if pen not found. Clobbers all registers.  
 \$33+FIND CLSC Sets page two \$0C00-\$0BFF to black. All registers, GBASL/GABSH clobbered.  
 \$56+FIND PG2B Generates base address for page two. Enter, Y ordinate/2 in A reg. Returns: Page two base address in GABSL/GABSH. Clobbers A reg.



## INSTALLATION

1. Remove the rubber band securing the cable and connector from the pen body.
2. Remove top cover of Apple using the procedure outlined in the Apple manual.
3. Insert the Pointer plug into the Apple game I/O connector with pin one (1) to front of Apple, (cable to rear of Apple).

NOTE: Make sure Apple power is off.

Make sure Pointer plug is oriented correctly and that plug is not offset towards the front or rear of connector.

4. Dress Pointer cable through one of the cable exit slots in rear of Apple.
  5. Replace top cover on Apple using the procedure outlined in Apple manual.
- Installation is complete.

## LOADING DRIVER

1. Insert the supplied cassette in tape recorder 'A' side up and rewind to beginning of tape.
  2. Turn on Apple.
  3. Key Reset.
  4. Key 300.3EBR
  5. A. On tape recorders equipped with an output monitor.
    1. Start recorder in Play.
    2. When presence of leader tone is indicated on output monitor, Key Return.B. On tape recorders not equipped with an output monitor.
    1. Remove output jack from recorder.
    2. Start recorder in Play.
    - When tone is heard from recorder speaker, immediately Stop recorder.
    3. Reconnect output jack to output of recorder.
    4. Start recorder in Play, immediately key Return.
  5. When Apple beeps and prompts on no error, stop recorder and rewind tape.
- Driver is loaded.

## CALLING POINTER AND RETRIEVING DATA

Pointer expects Hires to be CLEARED when called. Pointer first sets Graphics mode of display, then selects page two for its search. The entire page is searched for the pen location. However, if Mixed graphics has been selected by the calling program, Pointer will locate the pen in the area of the page defined as the graphics area only. Before returning, page one(1) display area is set.

From Integer Basic

Initialize LOMEM:3072

010 CALL 768

020 Y=PEEK (30): X=PEEK (31)

Is an acceptable format, Pointer does not restore the Y register.

As a result the call to the Pointer routine MUST be the last command in a Basic source line.

From M/L

JSR \$0300

On return:

X ordinate in \$001F

Y ordinate in \$001E

All registers stepped on. GABSL/GABSH clobbered.



## IF DIFFICULTIES ARE ENCOUNTERED

### Display quality

Most displays may be adjusted to operate with Pointer. Pointer is as literal as your Apple. It cannot interpret data from a poor quality display. Commercial TV sets, in many cases, have a 'soft' second anode supply. As the Pointer driver paints the different pictures on the screen necessary to locate the pen, CRT beam current undergoes large fluctuations, which may result in different size pictures on the various scans. If the degradation is of sufficient magnitude, Pointer will not locate the correct point. The face plate on most CRT's is in the order of  $\frac{1}{4}$ " thick, leading to parallax error. The only solution is to point with care.

Load the following integer Basic program to help tune the display.

```
LOMEM:3072
10 GR: COLOR=15
20 INPUT C$: CALL 768
30 PLOT PEEK(31), PEEK(30): GOTO 20
```

### RUN

1. Turn brightness and contrast controls to full minimum.
2. Increase brightness control until first sign of background illumination.
3. Increase contrast control until RUN is legible in text area of display.
4. Increase brightness control until first sign of background illumination.
5. Place Pointer tip perpendicular to screen in graphics area.
6. Key Return.
7. If you do not have a white spot under pen tip, be sure you held pen still during scan, increase contrast slightly, go to step 4.
8. With white spot under the pen, go to step 5 for several other screen positions, particularly the corners of the graphics area where many displays have trouble.

In general, the key to successful pointing is: Minimum brightness consistent with accurate location and text legibility.

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