Logical Input Devices

Physical Devices are mapped onto Logical Input Devices,
which are divided into six different classes according to ISO/ANSI API standards

/** GKS, PHIGS, PHIGS+ **/

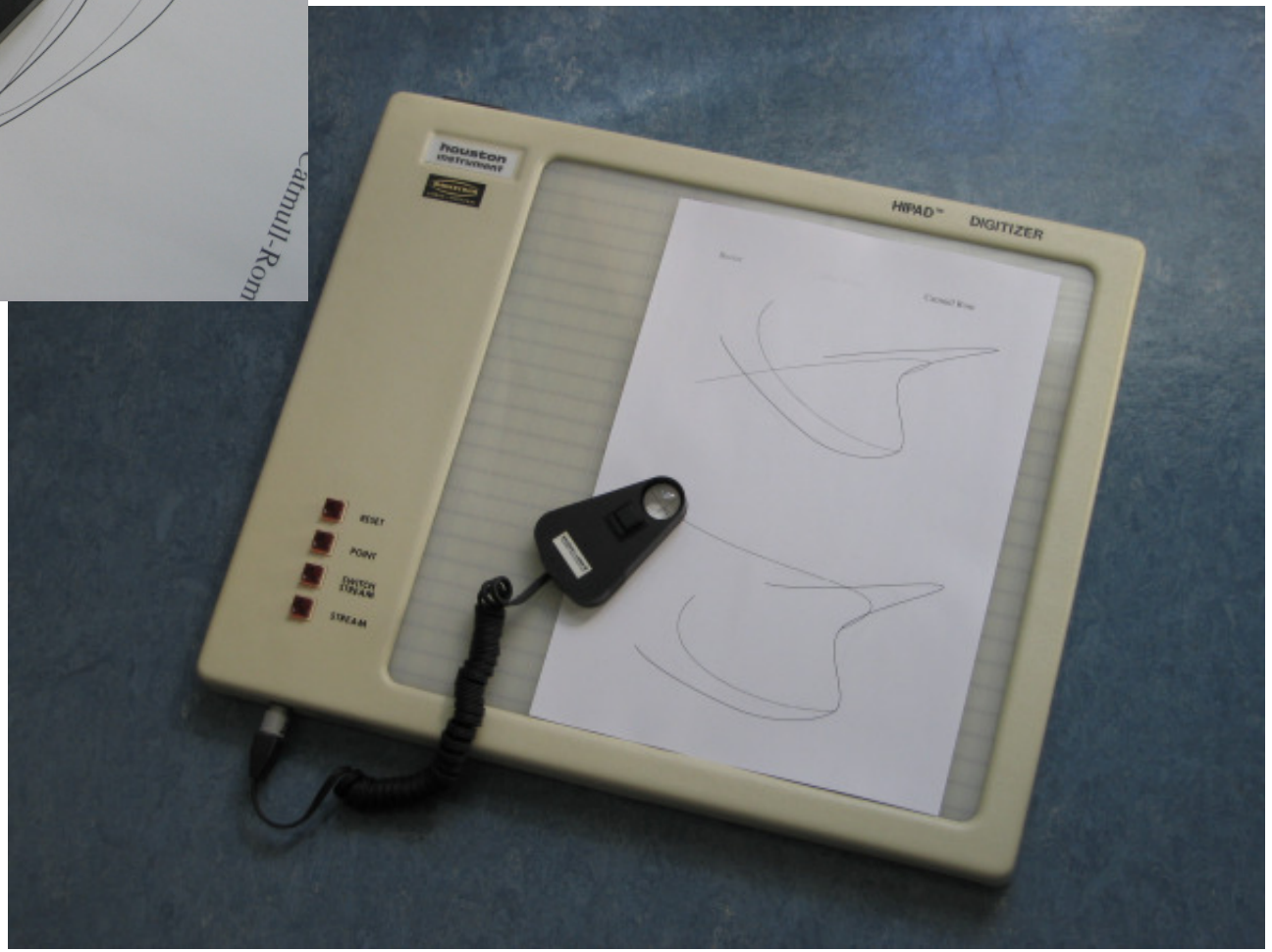
Logical Input Classes

LOCATOR	Returns a position in World Coordinates.
STROKE	Returns a sequence of points in World Coordinates.
VALUATOR	Returns a real number.
CHOICE	Returns a selection (positive integer) from a set of alternatives.
PICK	Identifies a displayed and selected object (pick path).
STRING	Inputs a sequence of characters.

Crosshairs

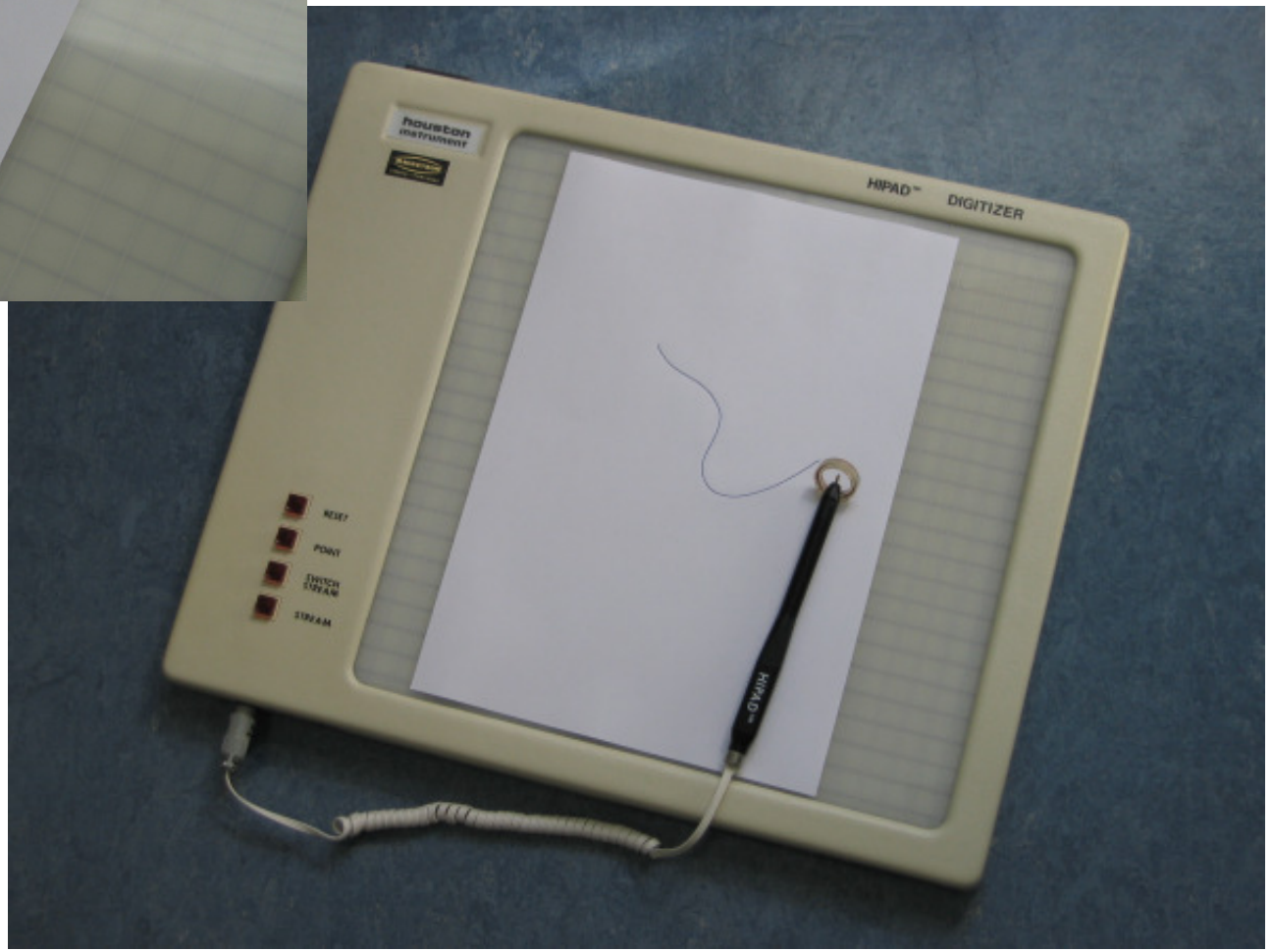
re-creation in DVST
(old technology)

(1-button puck)



Tablet
(old model)

Physical Devices



Tablet
(old model)

Physical Devices

Pen Tablet

Tablet

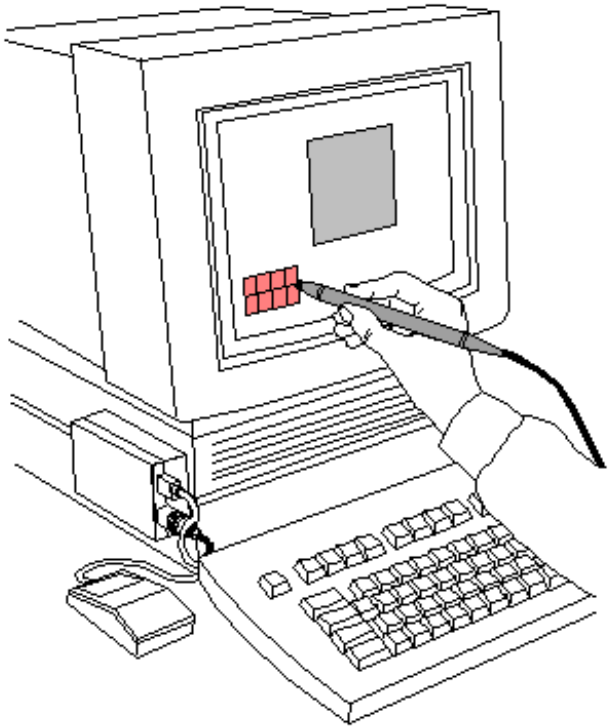
(with
16-button
puck)

Dials
(Potentiometers)

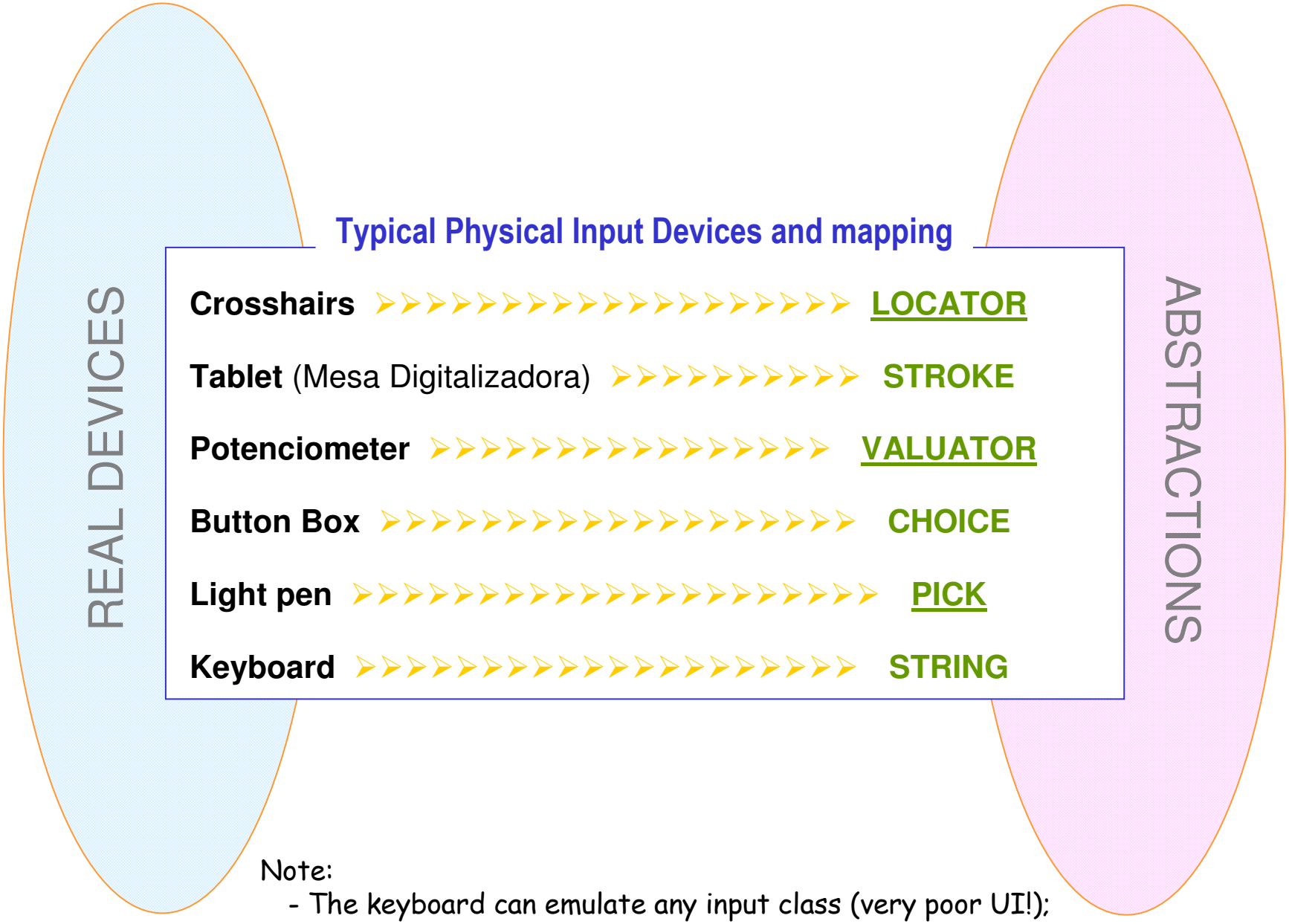

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
REMOTE BUTTON BOX
CON HI
CON LO
SPICE AUTOMATION
SKY-SKAN, INC.

Button Box

From Computer Desktop Encyclopedia

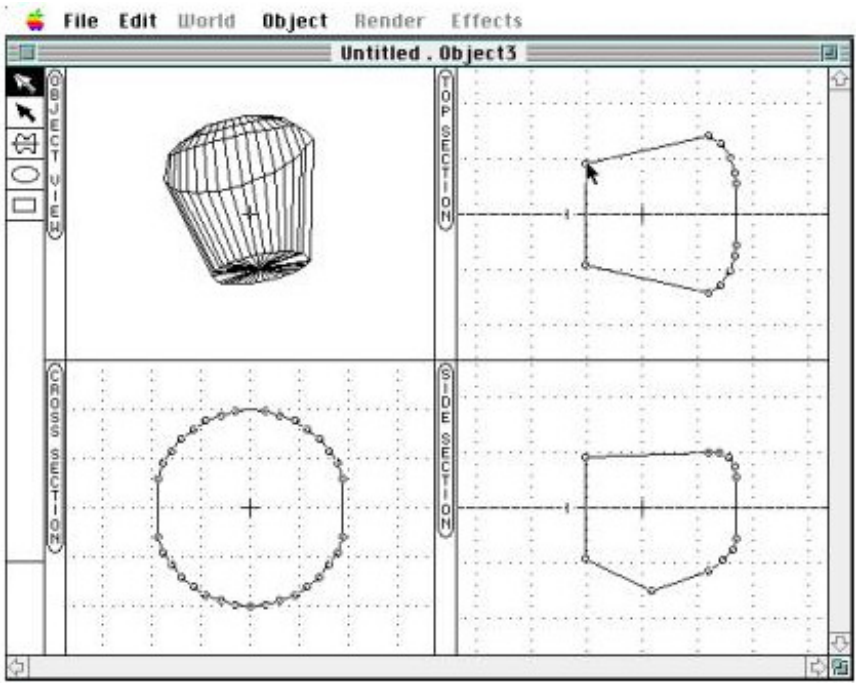


Light pen
(old technology)

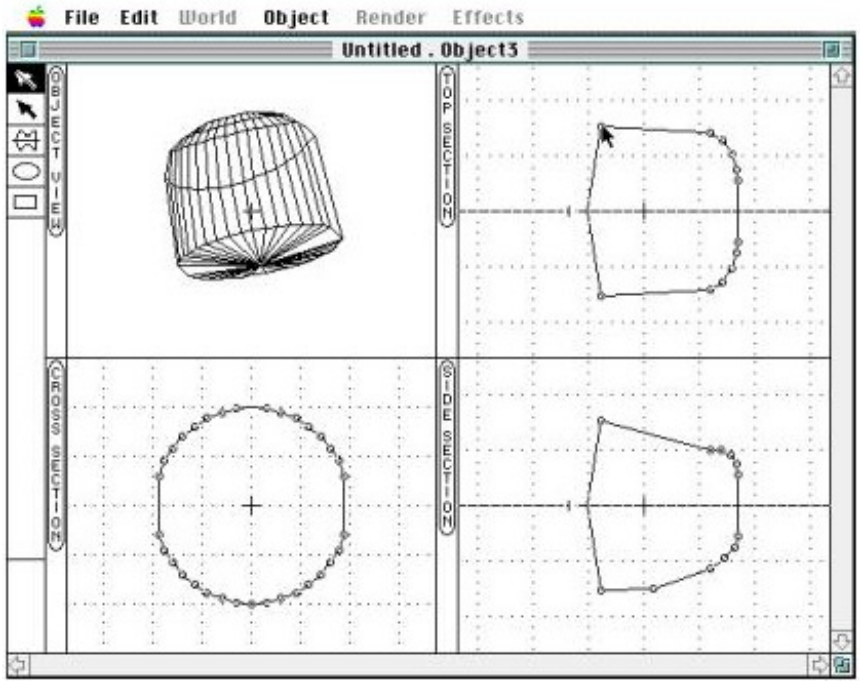


Note:

- The keyboard can emulate any input class (very poor UI!);
- The underlined names are still used nowadays.

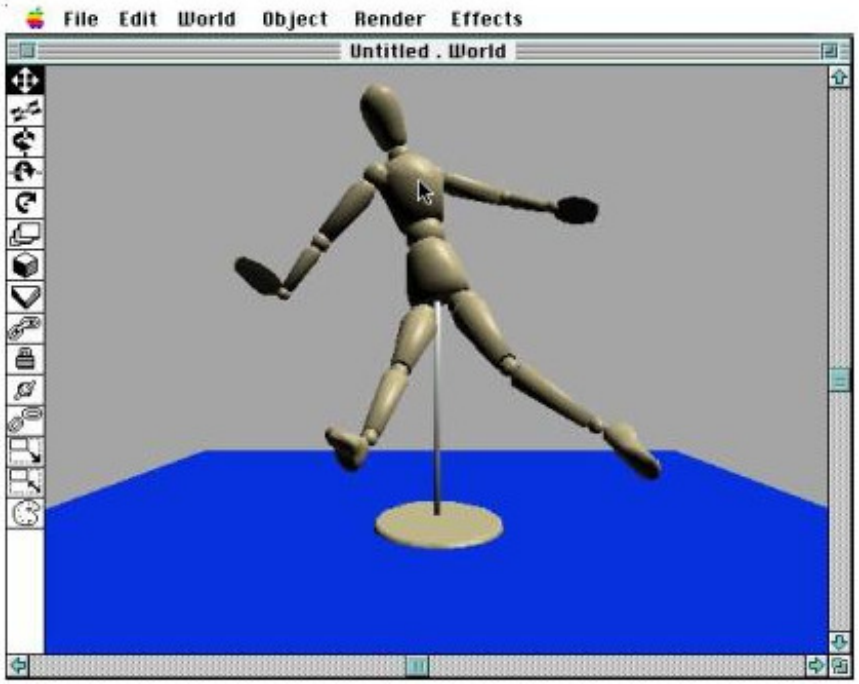


PICK



LOCATOR

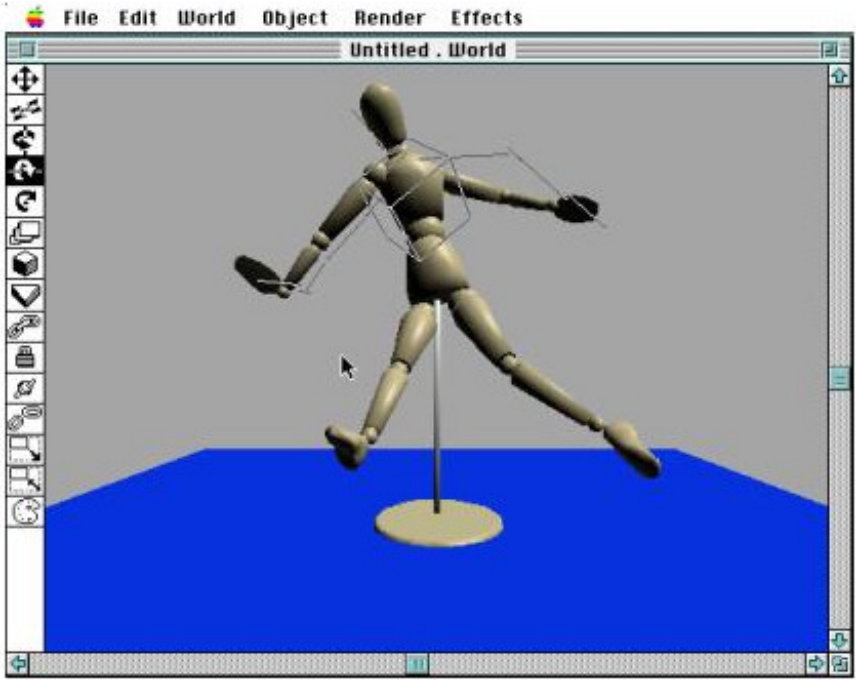
M.Próspero



Initial screen image

PICK
(with visual feedback)

M.Próspero



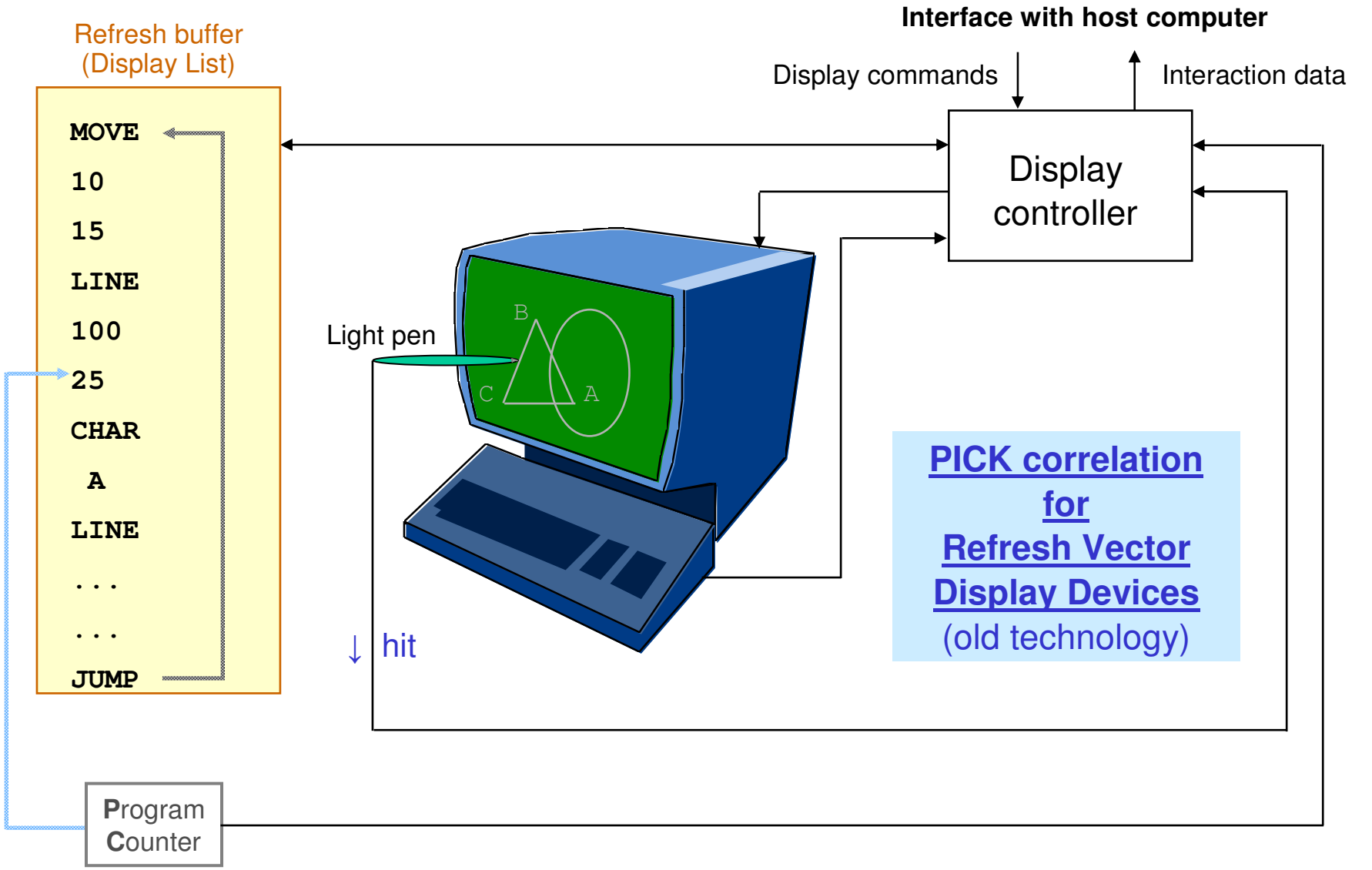
CHOICE (menu item)

followed by

VALUATOR (rotation)

Final screen image

M.Próspero



When a hit is detected by the Display Controller,
the Program Counter indicates the location of the selected object in the code

PICK CORRELATION TRAVESSAL FOR RASTER GRAPHICS

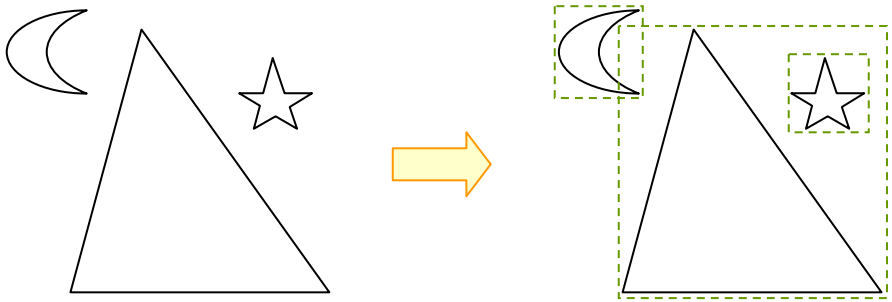
(1) ANALYTICAL HIT DETECTION

Algebraic equations are used to determine whether the DC (device coordinate) primitive lies sufficiently close to the 2D DC locator measure.

Algorithms are needed for:

- **Computing the distance from the cursor position to each line segment.**
- **Determining if the cursor position lies inside a polygon** [see the even-odd fill area algorithm]**.**
- **Comparing the locator position to the rectangular screen extent for nongeometric text.**

Optimization/approximation can be done by using Screen Extents:



Problems with the selection of the *star* ?
A possible solution: priority lists based on the object size (*star* → *moon* → *triangle*)

PICK CORRELATION TRAVESSAL FOR RASTER GRAPHICS

(2) HIT DETECTION VIA CLIPPING

Hardware clipping devices and/or optimized software clipping utilities allow the application to determine whether any part of a primitive´s image lies inside a 2D integer clip rectangle (a small square surrounding the cursor position called PICK WINDOW) without having actually to draw the primitive on the screen for that purpose.

One of the following methods can be used :

- **Drawing into an offscreen pixelmap (buffer) and checking if any pixels are changed.**
- **Hit detection returned by the clipper.**

To be compared with the Light Pen technique (see the PICK applet example)

A stack of names (push&pop procedures) is used and the current name is read every time a hit is detected. Then we can easily identify the associated set of primitives responsible for the hit.

Próximos capítulos: 2.º Ciclo

Interacção Pessoa-Máquina

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