

Mouse Services

Interfacing with the mouse :-

- **second primary input devices used is the mouse.**
- **greater flexibility and movement**
- **mouse system consist of the mouse and the mouse driver.**
- **mouse driver is the memory resident program that provides communication between the mouse and the computer.**
- **mouse driver maintains the cursor position of the mouse and the status of the mouse buttons.**

Mouse Services

- You can access the cursor position and the button status with interrupt 33h.
 - The mouse driver has several functions by specifying the function number in the AX register when calling interrupt 33h. Function Meaning
- | | |
|---|--|
| 0 | Resets the mouse and retrieves the mouse status. |
| 1 | Displays the mouse cursor. |
| 2 | Hides the mouse cursor. |
| 3 | Retrieves the mouse cursor positioned the status of the mouse buttons. |
| 4 | Retrieves the number of times a button was pressed since the last call. |
| 5 | Retrieves the number of times a button was released since the last call. |
| 6 | Specifies the horizontal limits for the cursor. |
| 7 | Specifies the vertical limits for the cursor. |
| 8 | Specifies the cursor to use for graphics modes. |
| 9 | Specifies the cursor to use for text modes. |

Getting Started with the Mouse

- **There are two things you need to know before we started to use the mouse. First under DOS, you must load the mouse driver software that came with your mouse before trying to use it.**
- **Initializing the Mouse:**
 - INT 33H Service 0
 - put AX = 0
 - Returns : AX = 0 means Failure.

```
MOV AX,00  
INT 33H  
MOV Result,ax
```
- **Using INT 33H service 0 is the necessary first step toward using the mouse. If this service returns a nonzero value, the mouse is initialized. Otherwise, the mouse can not be used (because it is not installed in the computer or the mouse driver is missing). In that case, and if your program depends on the use of a mouse, you should print out an error message and quit.**

Display Mouse Cursor

- **Once the mouse is initialized, you've all set until the computer is turned off- you don't have to initialize it again (although doing so does no harm).**
- **initializing the mouse does not display the mouse cursor. A function that initialize the mouse and returns the result**
- **INT 33H Service 1 Display Mouse Cursor**

```
mov ax,01h
```

```
INT 33H
```

- **At this point, the mouse system is active and the cursor has appeared on the screen. We can also make it vanish using INT 33H service 2 to hides the mouse cursor.**

Hide Mouse Cursor

- **If the cursor is already off, it stays off. (INT 33H Service 2)**
- **The very important reason for hiding the mouse cursor, as the mouse cursor moves over the screen, the mouse driver software reads the character at the preset position before it displays the mouse cursor.**
- **Then, when the mouse cursor moves on, that character is restored, attributes and all. However, this means that if you have changed the screen display behind the mouse cursor (for example, opened a window there), it will still restore the original-and wrong- character, leaving a one-character hole. To avoid this problem, you can turn the mouse cursor off when displaying a window or over-writing the mouse cursor in any way, and turn it on again immediately afterwards.**

```
mov ax,02h
```

```
int 33h
```

Mouse Buttons

- We can also read right and left button information from the mouse INT 33H service 3. Let's look at that process next.

Getting Mouse Information:

INT 33H Service 3 Set AX = 3 This will return:

BX	Means
0	No button down
1	Left button down
2	Right button down
3	Both button down

CX = Current mouse cursor column

DX = Current mouse cursor row

Mouse Position

```
mov ax,03h  
int 33h  
mov button,bx  
mov row,dx  
mov col,cx
```

- This service, service 3, returns information in BX, DX, and CX. BX indicates which button(s) is (are) down. This service also returns the current row and column of the mouse cursor in DX and CX, respectively. These numbers are measured in pixels, in 640 x 200 mode, DX can range from 0 to 199 and CX from 0 to 639. If you want to convert from pixel to alphanumeric columns and rows, just integer divide the pixel range by 8.

Mouse Position

- The most severe limitation here is that service 3 only provides an instant snapshot of what's going on with the mouse. If you want to use it for mouse input, you have to keep "Polling" it , that is, looping over it until something happens.