Instrumental technique

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Computer mouse

- A **computer mouse** is a pointing device (hand control) that detects two-dimensional motion relative to a surface. This motion is typically translated into the motion of a pointer on a display, which allows a smooth control of the graphical user interface.

- The mouse was invented by Douglas Engelbart in 1964 and consisted of a wooden shell, circuit board and two metal wheels that came into contact with the surface it was being used on.

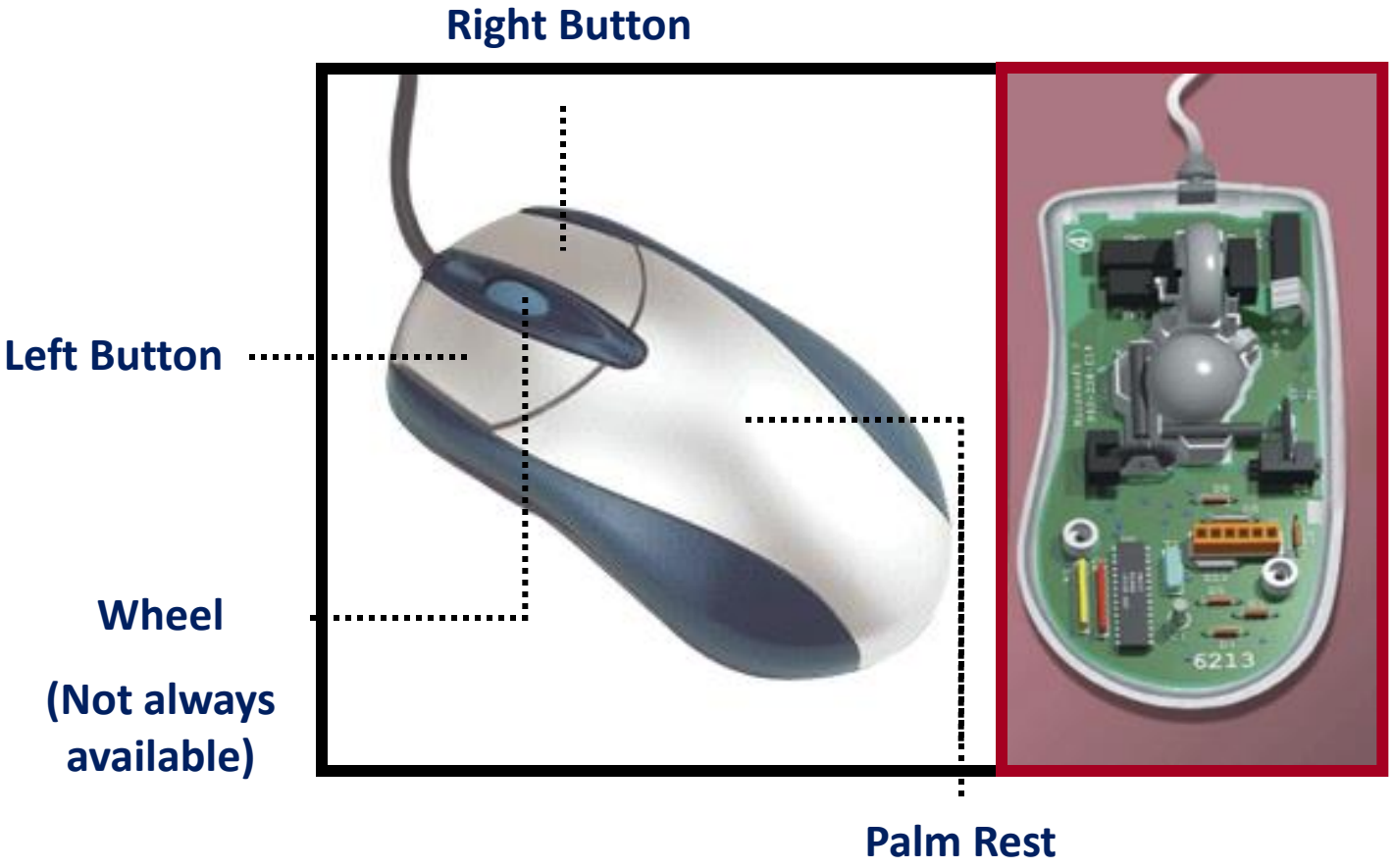
- It was 8 years later in 1972 that Bill English developed the design further by inventing what is known as the "Ball Mouse" that we know today.

- The mouse became part of the ground breaking Xerox Alto computer system which was the first minicomputer system to offer a graphical user interface.

- An optical mouse was developed in around 1980, eliminating the ball which often became dirty from rolling round the desktop, negatively affecting its operation

- In 1988, US patent no. 4751505 was issued for an optical mouse invented by Lisa M. Williams and Robert S. Cherry, which was to be sold commercially with Xerox products, such as the Xerox STAR

Parts of the Mouse

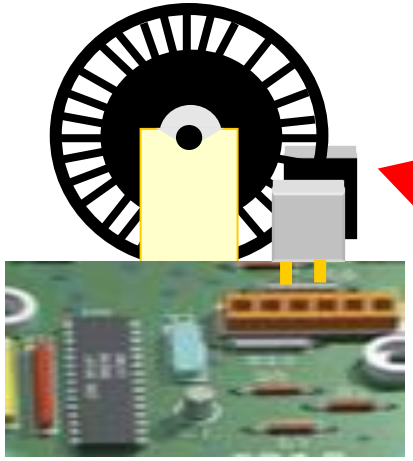


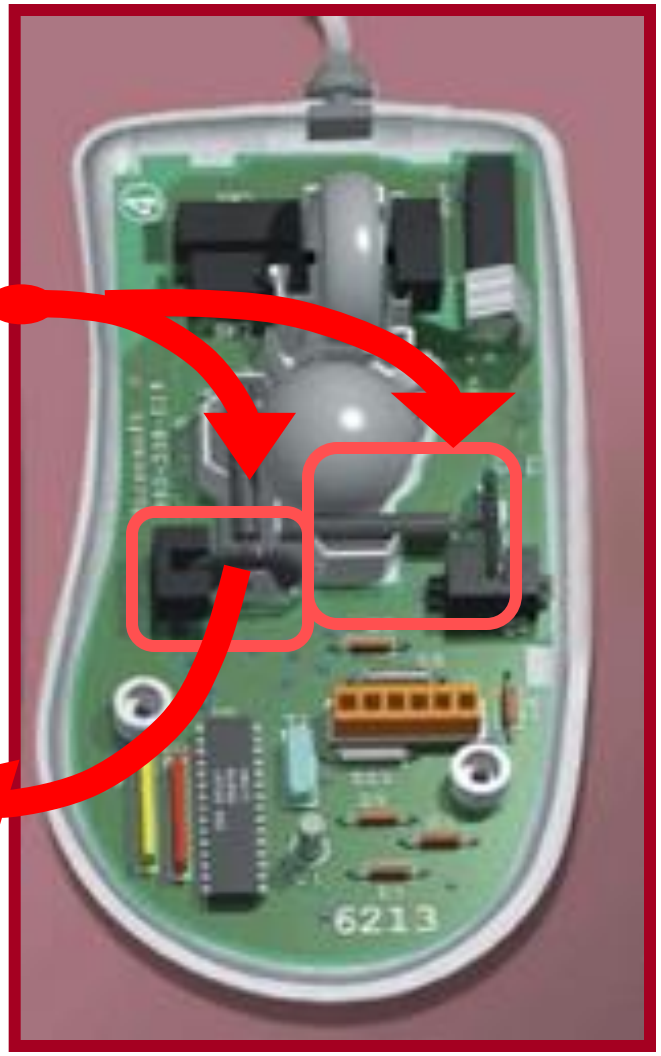
Parts of the Mouse

- A ball inside the mouse Touches the desktop and rolls when the mouse moves.

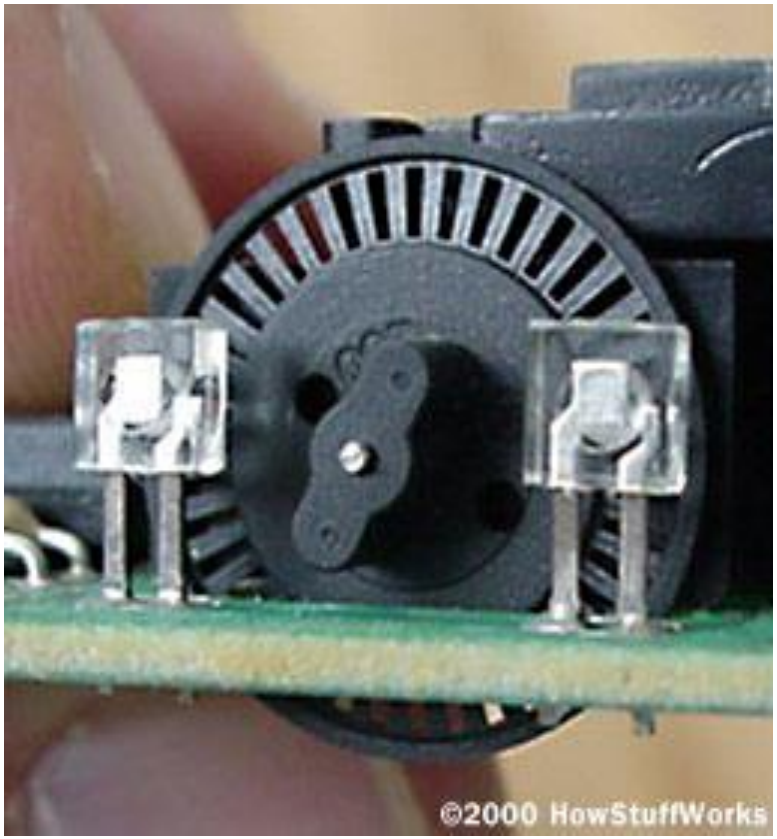
- **Two rollers** inside the mouse touch the ball. One of the rollers is oriented so that it detects motion in the X direction, and the other is oriented 90 degrees to the first roller so it detects motion in the Y direction. When the ball rotates, one or both of these rollers rotate as well

Optical encoding disk

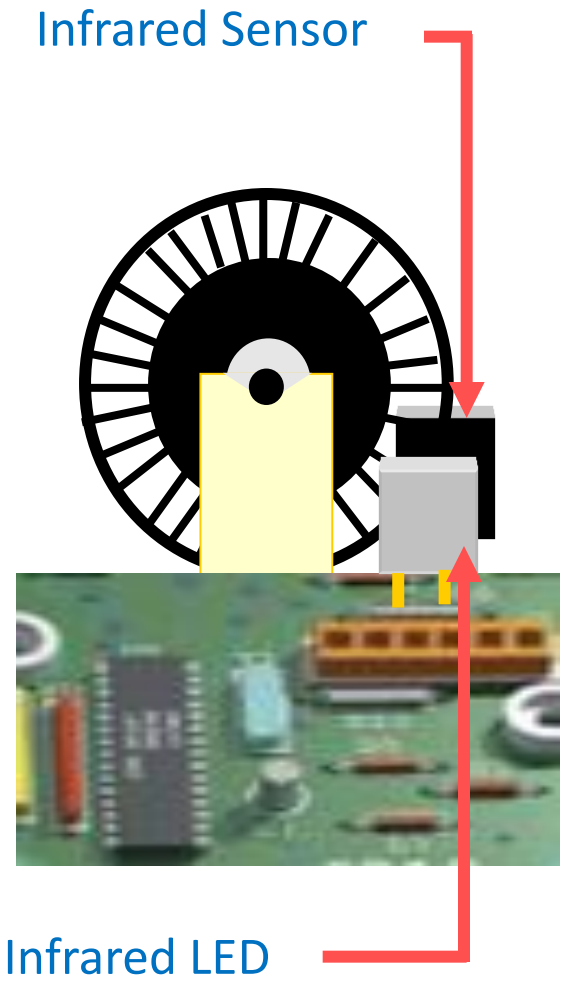




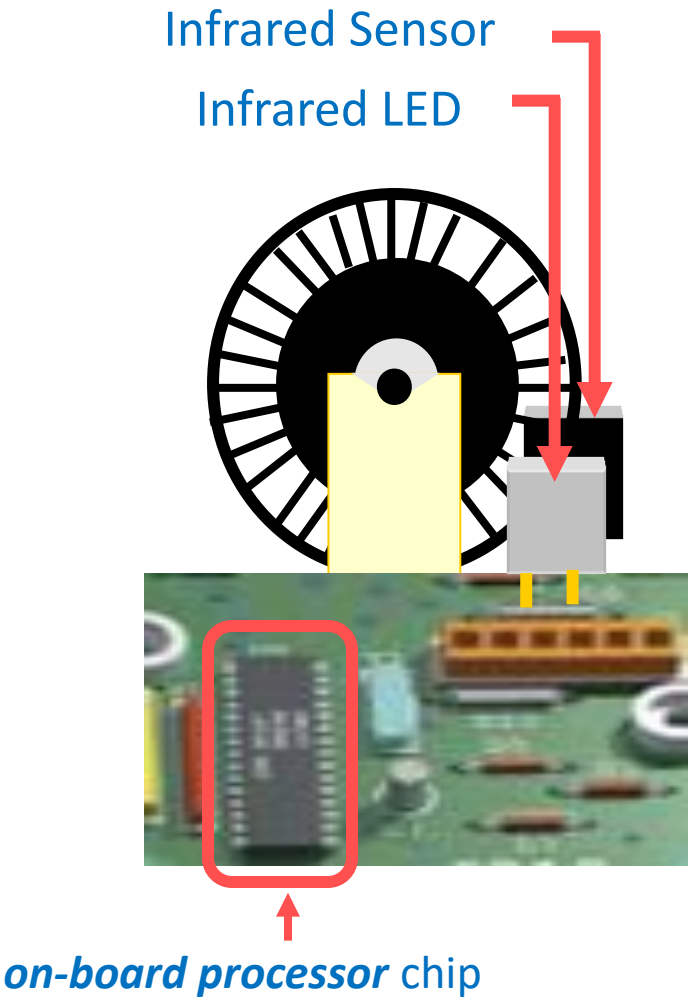
- The rollers each connect to a **shaft**, and the shaft spins a **disk** with holes in it. When a roller rolls, its shaft and disk spin. The following image shows the disk



- On either side of the disk there is an ***infrared LED*** and an ***infrared sensor***. The holes in the disk break the Beam of light coming from the LED so that the Infrared sensor sees pulses of light. The rate of the pulsing is directly related to the speed of the mouse and the Distance it travels.



- An ***on-board processor*** chip reads the pulses from the infrared sensors and turns them into binary data that the computer can understand. The chip sends the binary data to the computer through the mouse cord.



The Optical Mouse

- Developed by ***Agilent Technologies*** and introduced to the world in the late 1999, the optical mouse actually uses a tiny camera to take 1,500 pictures every second.

- Pictures counting about 1500 per second are taken by bouncing light from a small, red light-emitting diode (LED) off the surface under the mouse, and onto a Complimentary Metal-Oxide Semiconductor (CMOS) sensor.

- The sensor sends each image to a digital signal processor (DSP) for analysis. DSP compares the pictures and determines the speed and direction of movement and sends the corresponding coordinates to the computer.

- Able to work in any surface

- Has a small red light- emitting diode (LED) to detect movement.

- More precise than a mechanical mouse

- Connects using a cable or wireless

Mouse Actions:

1. Click
2. Double-click
3. Right-Click
4. Point
5. Drag

How to hold the mouse

Thank you