



Optical disk storage

 CD / DVD / Blur-Ray

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A white ceramic cup with a blue and green floral pattern sits on a matching saucer. A tea bag is in the cup, and steam is rising from it. A silver spoon rests on the saucer. The background is a blurred wooden chair. A semi-transparent grey arrow points from the left towards the right, containing the text.

What is optical disk storage?

Introduction

- interchangeable mass storage
- read and written by optical scanning
- rotating memory in diskform



Development of optical disk storage





Development

- 1982: Audio-CD: Music-Albums, 650 MByte (74 min.)
- 1985: CD-ROM: Computer data, 700 Mbyte
- 1990: CD-R: Computer data, Music
- 1996: DVD-ROM: Data, Videos, 4.7 Gbyte
- 1997: DVD-R: Data, Videos, 8.5 GByte (DL)
- 1998: DVD-RAM: Computer data, 4.4 Gbyte
- 2006: Blu-ray Disc: HD-Movies, Data, 50 Gbyte
- 2006: HD-DVD: HD-Movies, 30 GByte

CD



CD

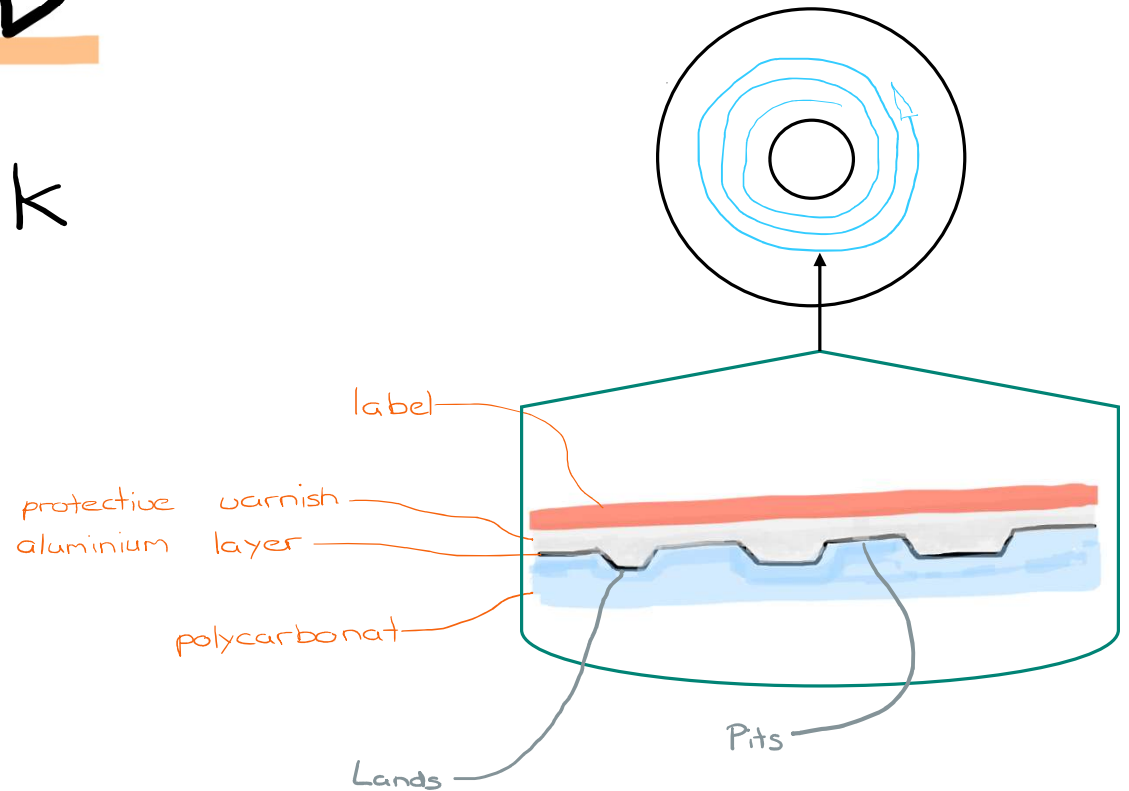
- compact disk
- since 1982

[\varnothing 12 cm
↑↓ 1,2 mm

Shifts:

- Pit = 0

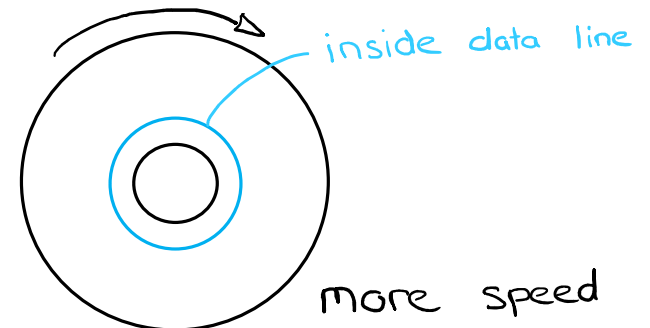
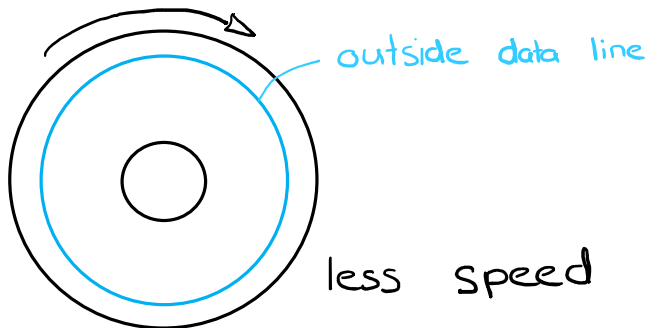
- Land = 1



ODD

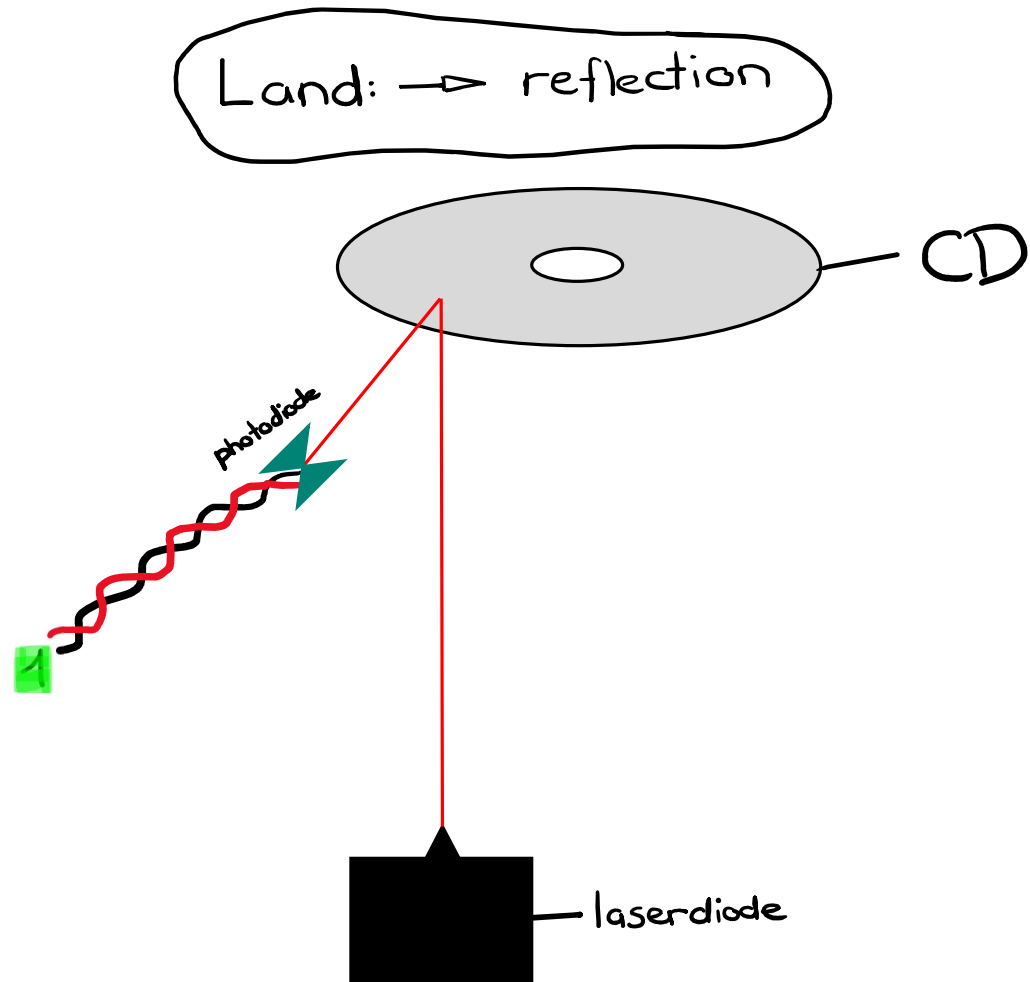
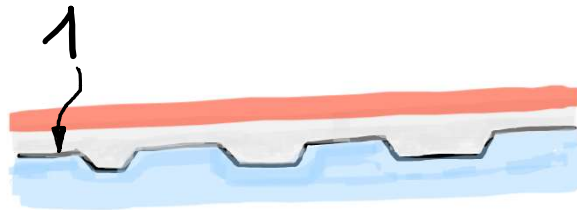
— optical disc drive

- engine → rotate the CD
 - ↳ CLV (constant linear velocity)
 - regulates the data read speed



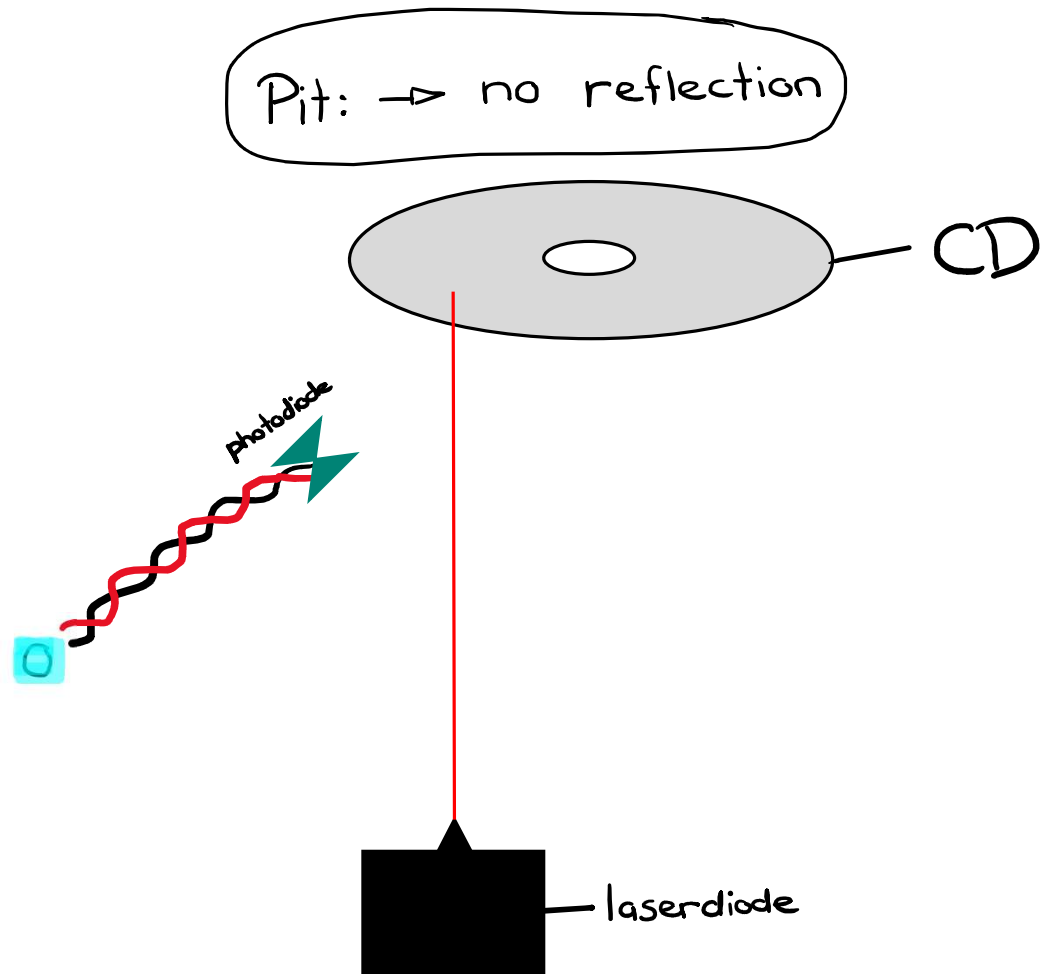
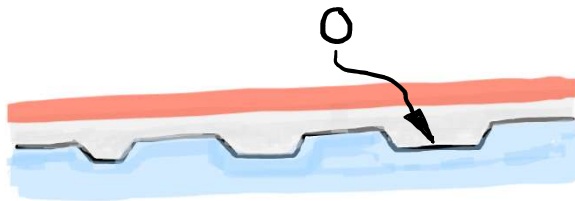
Laser

- read
- write

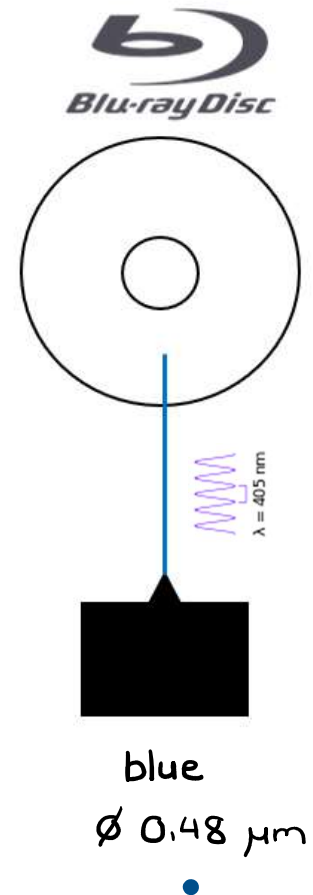
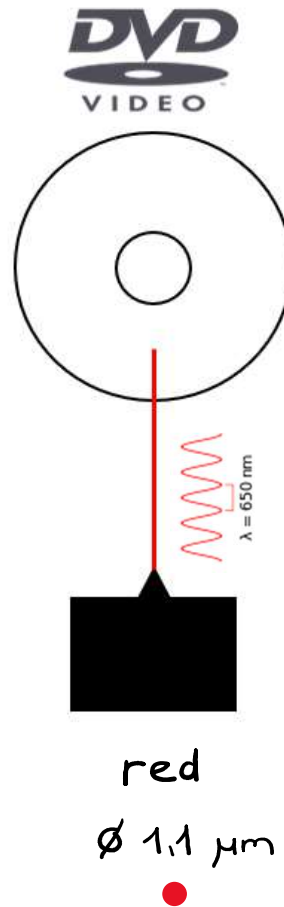
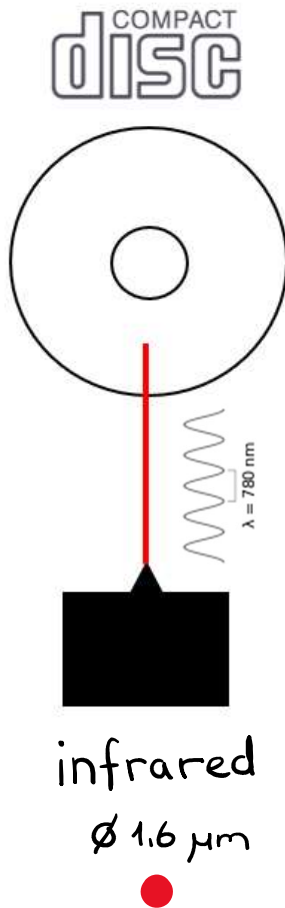


Laser

- read
- write



different Lasers

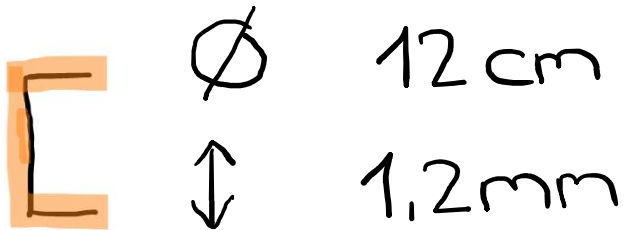


CD-R

— compact disk – recordable

* one time recordable

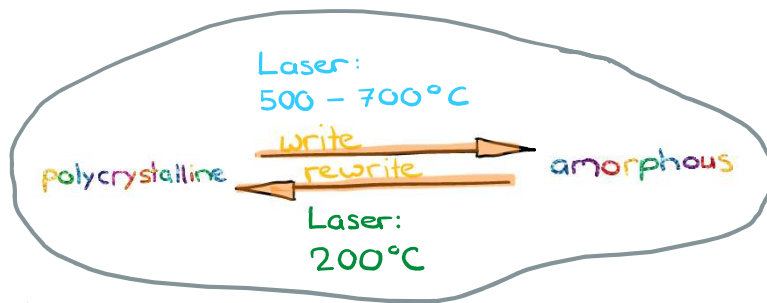
organic dye



CD-RW

compact disk - rewritable

* 100'000 rewritable



Silver-indium-antimony-tellurium alloy



DVD



DVD

=> 4.7 GB

— digital versatile disc

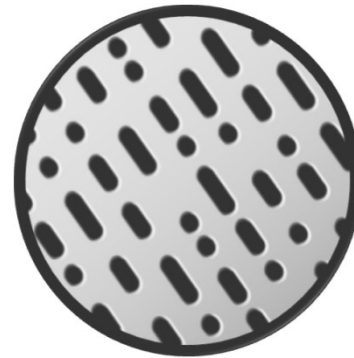
↳ more data storage than a CD

CD:



data structure

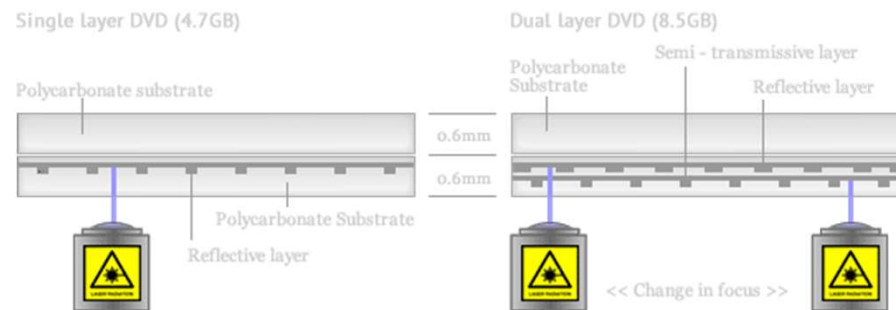
DVD:



data structure
2

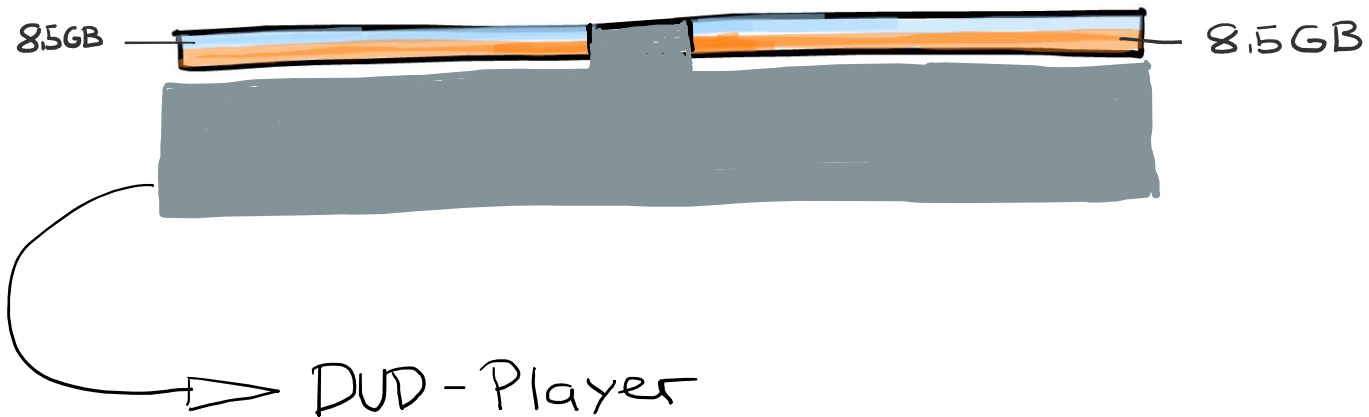
Double Layer DVD

- Two data layers \Rightarrow 8.5 GB
- lower layer semi-transparent
- select by change of focus



Double site data track DVD

=> 17 GB



Blu-Ray



Blu-Ray



CD

DVD

Blu-Ray

=> 25 - 128 GB

Single
Double
Triple
Quad

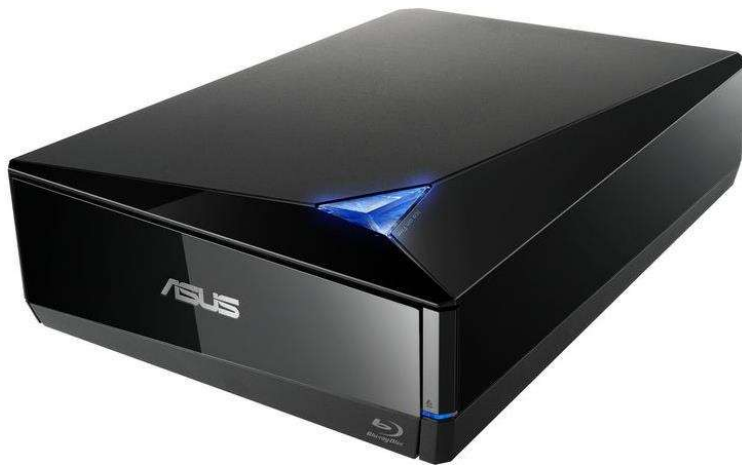
Layer

External optical drive



External optical drive

Example: Asus BW-16D1H-U Pro



Opportunities:

- write + read
(CD, DVD, Blu-Ray)
- Burn 16x faster

A photograph of a white ceramic cup with a blue and green floral pattern, filled with tea. A teabag is in the cup, and steam is rising from it. The cup sits on a matching saucer on a wooden table. A silver spoon lies on the saucer. In the background, a wooden chair is visible but out of focus. A semi-transparent grey arrow-shaped overlay points to the right, containing the title text.

Advantages and Disadvantages of optical disk storage

Advantages and disadvantages



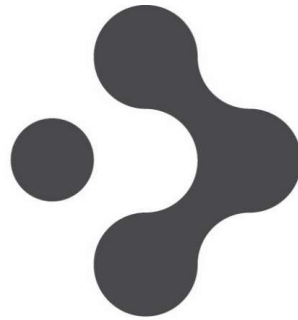
- low wear and tear → non contact w/r
- low cost
- high storage density → compared to floppy- or hard disks



- Sensitivity → improper storage
 - ↳ scratches
- limited number of write cycles → CD-RW



Questions ?



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