

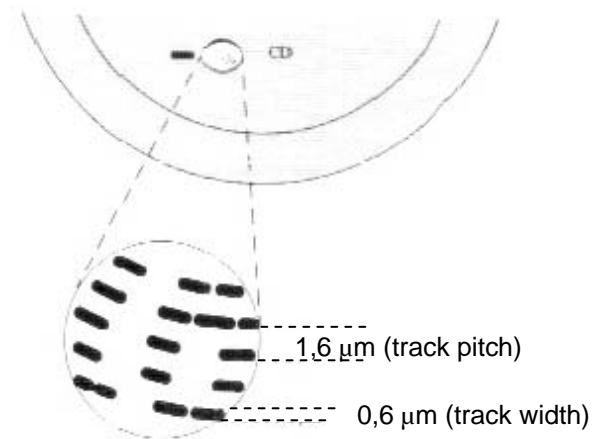
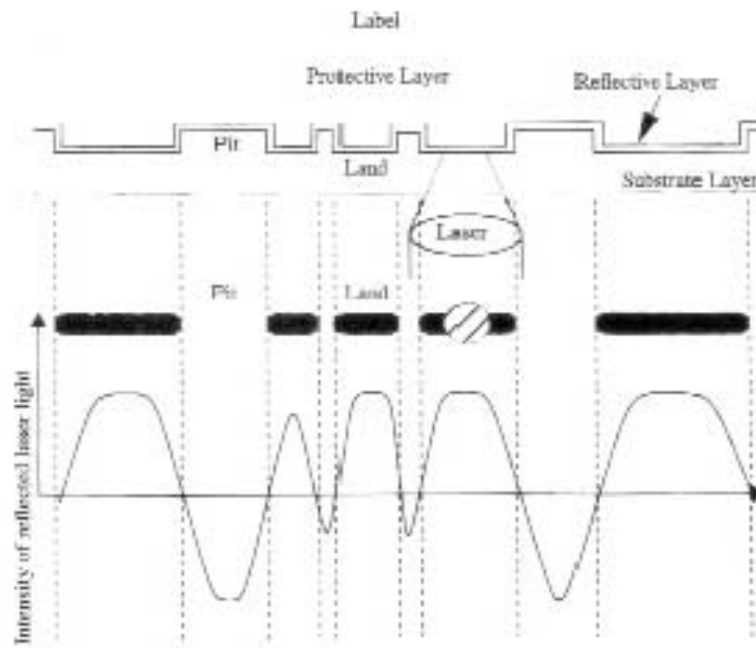


DVD

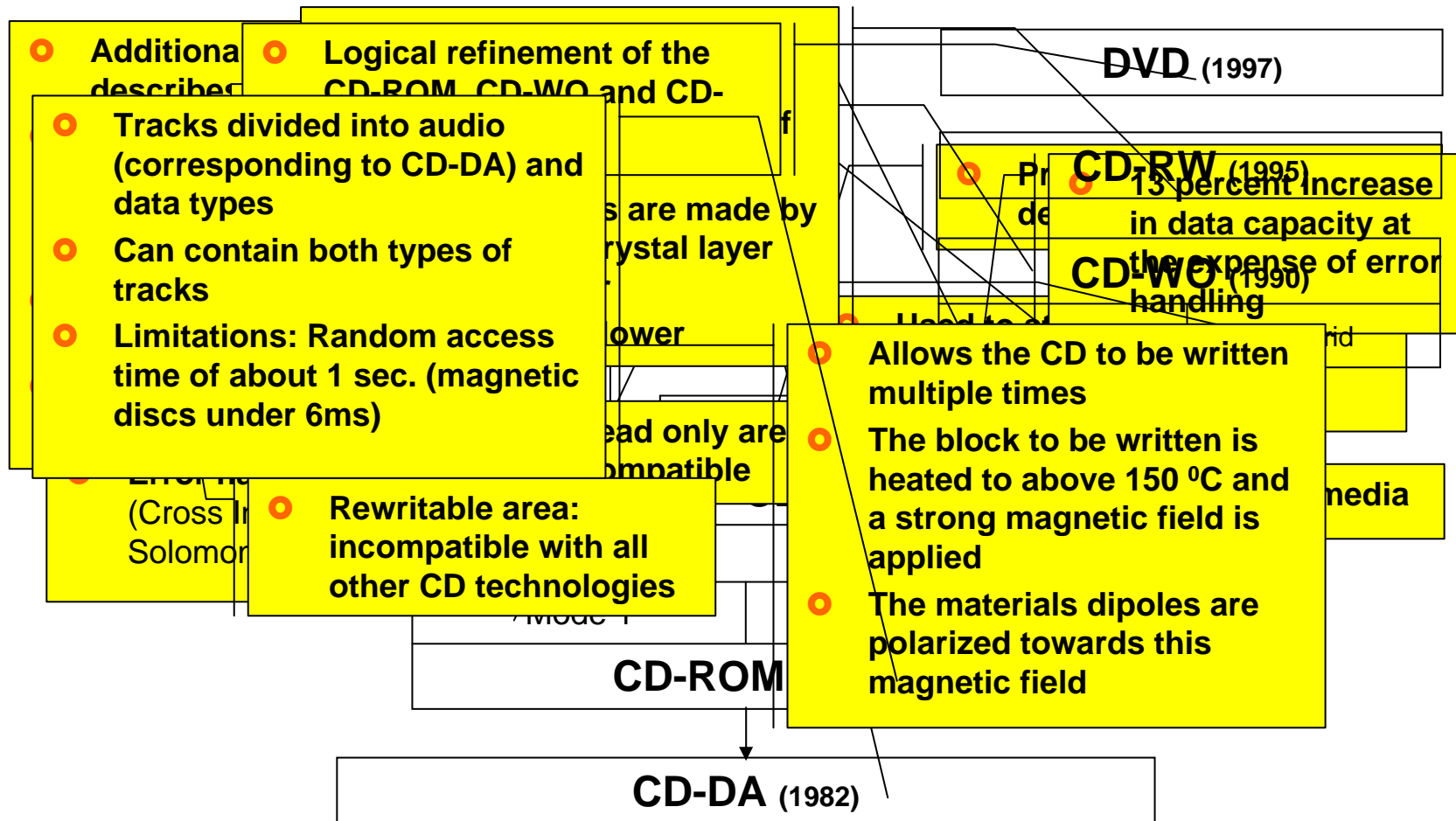
Development, Formats, Techniques, Trends

Basic Technology

- Optical storage Media: Information is represented by using the intensity of laser light reflected during reading

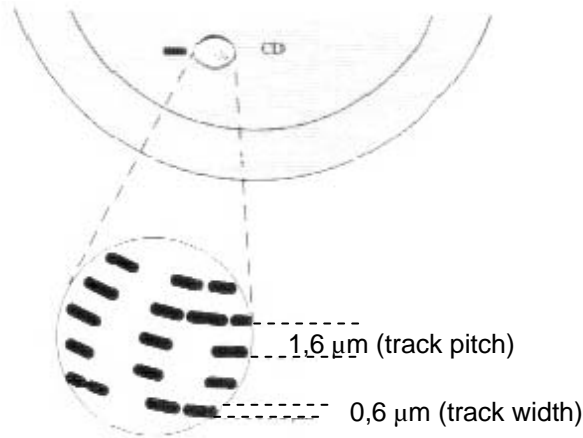


DVD - History

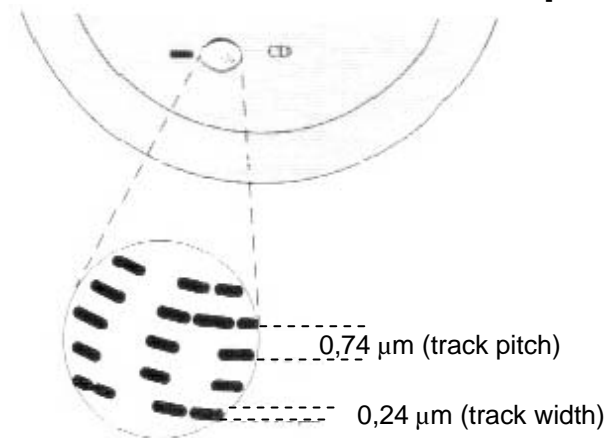


CD – DVD Comparison

- Data on a CD:
Track with “lands” and “pits”



- Data on a DVD:
Track with “lands” and “pits”



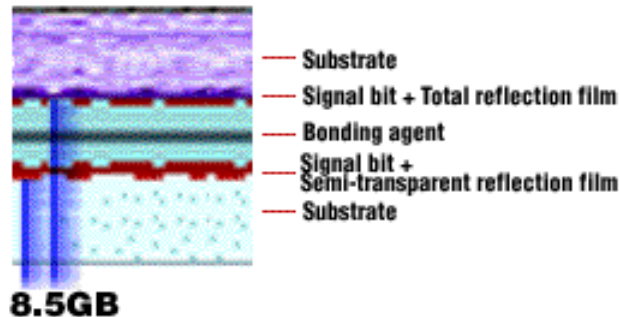
- High-density data storage
- Red laser with shorter wavelength; focusing the laser light through a large-aperture lens
- More efficient coding of bits and compression (MPEG2)
- More efficient error correction

CD – DVD Comparison

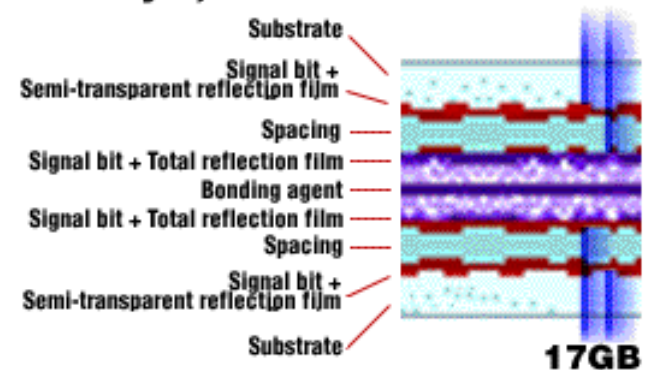
	CD	DVD
Media Diameter	about 120 mm	120 mm
Media Thickness	about 1.2 mm	about 1.2 mm
Laser Wavelength	780 nm (infrared)	650 and 635 nm (red)
Track Pitch	1,6 µm	0,74 µm
Minimum Pit/Land Length	0,83 µm	0,4 µm
Data Layers	1	1 or 2
Sides	1	1 or 2
Capacity	about 650 MB	about 4.7 GB (SLSS) about 8.5 GB (DLSS) about 9.4 GB (SLDS) about 17 GB (DLDS)
Video Data Rate	about 1.5 Mbit/s	1-10 Mbit/s (var.)
Video Compression Standard	MPEG-1	MPEG-2
Video Capacity	about 1 hour	Depending on format, 2 - 8 hours
Sound Tracks	2-channel MPEG	2-channel PCM 5.1-channel AC-3 Optional: up to 8 data streams
Subtitles	-	Up to 32 languages

Dual Layer – Double Sided

Dual-layer, single-sided disc



Dual-layer, double-sided disc



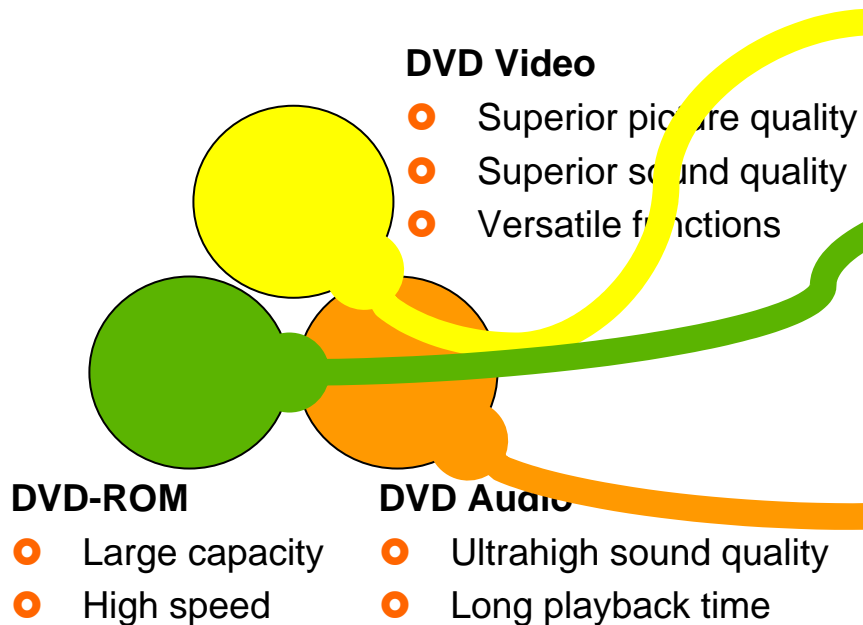
Performance achieved with DVD Standard

The DVD alliance has fulfilled all the desires of the computer industry:

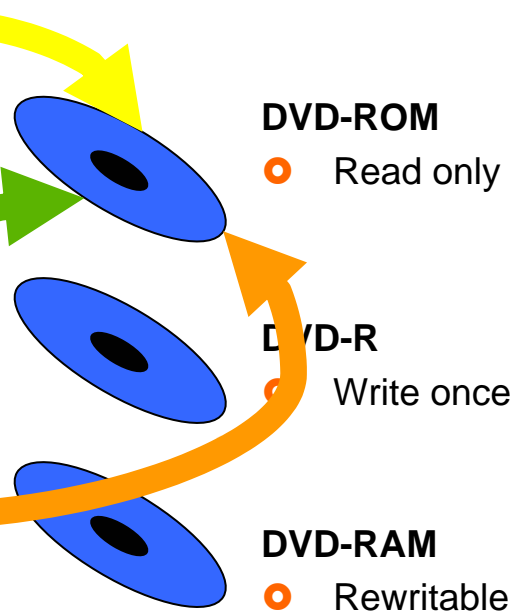
- A single interchange standard achieves compatibility between computer and TV applications
- DVD players and DVD-ROM drives can play back or read CDs without substantial additional cost.
- Compatibility will be retained for all DVD-ROM(read-only), DVD-R(write-once), or DVD-RAM(rewritable)DVD discs.
- DVD corresponds to the file system proposed by the software industry and the International Standards Organization (UDF, ISO9660).
- Except for writing on DVD-RAM(rewritable) discs, a caddy or cartridge is not required.
- The most reliable error correction method system currently available is used for both DVD-ROM(read-only) and DVD-RAM(rewritable) discs.
- Based on the single-side disc with 4.73GB capacity which can store a movie up to 133 minutes in length, the single-sided, dual-layer disc with 8.5GB capacity and the double-sided, dual-layer disc with 17GB are also standardized.
- High-performance data access will be achieved while maintaining compatibility between DVD-ROM(read-only) and DVD-RAM(rewritable) discs.

DVD Formats

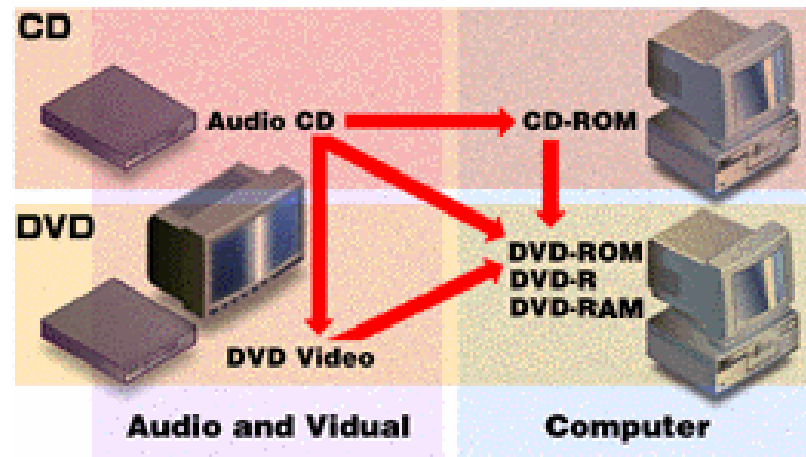
○ DVD's 3 application formats:



○ DVD's 3 recording types:



Compatibility of CD and DVD

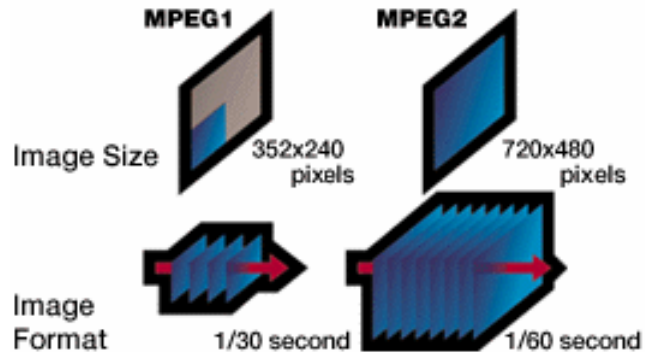


DVD Video

- 4.7 GB capacity of just one side of a DVD-Video disc is ample for storage of a **133-minute** movie with **dubbing in three languages**, **subtitles in four languages** and high-quality **5.1-channel digital surround sound**. Indeed, there is enough capacity for more than 90% of the movies on the market.
- Offers an entirely new experience in visual entertainment. Besides superior picture and sound quality, **various powerful functions** can be implemented for DVD.

Visual Functions of DVD Video

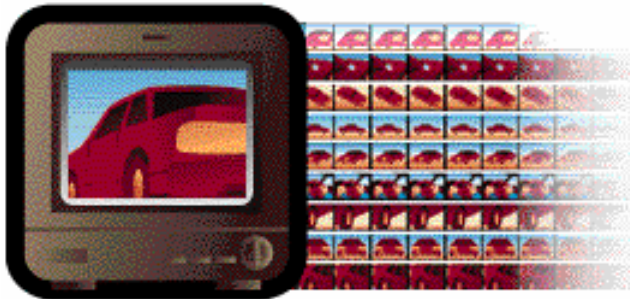
Picture quality of MPEG2



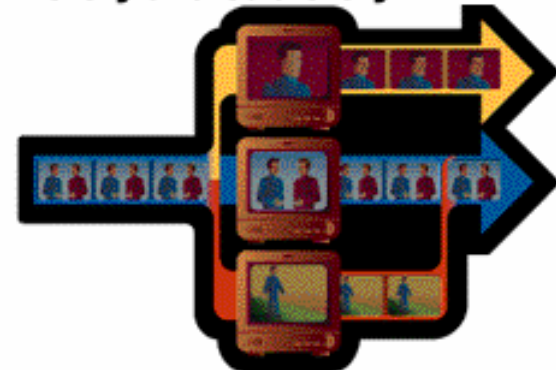
Multilingual Function for languages galore



Multi-angle Function for the angle of your choice



Main Story and Sub-Story

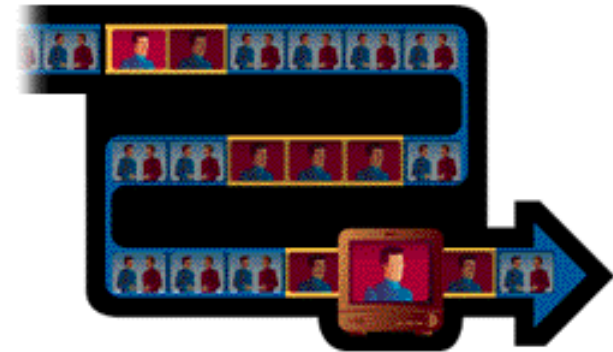


Visual Functions of DVD Video

Multiversion



Highlight Scene Scan



Branching Story

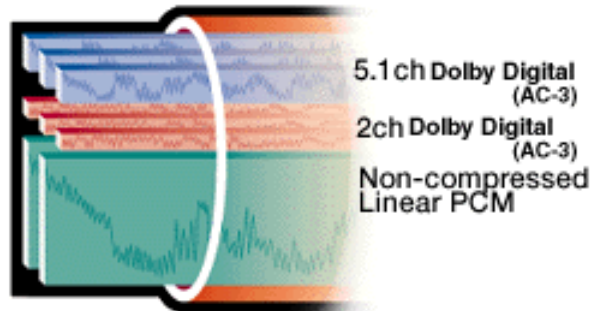


Parental Lock Function

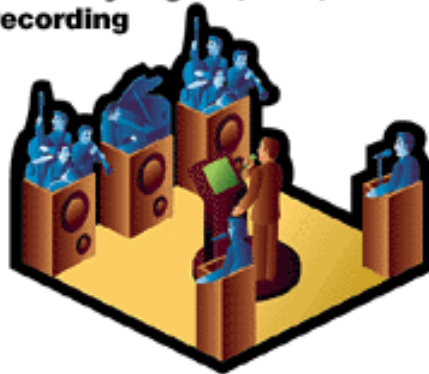


Audio Functions of DVD Video

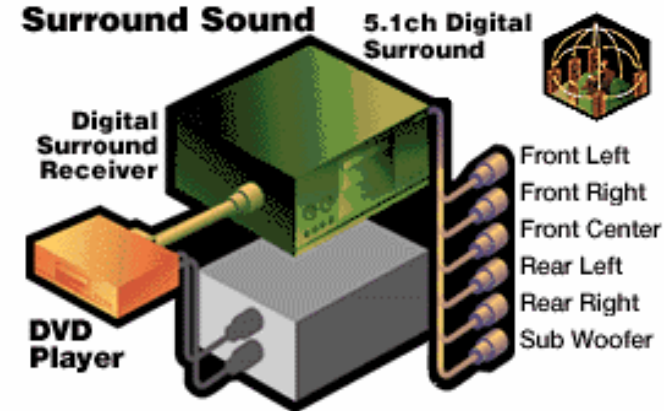
Eight sound streams



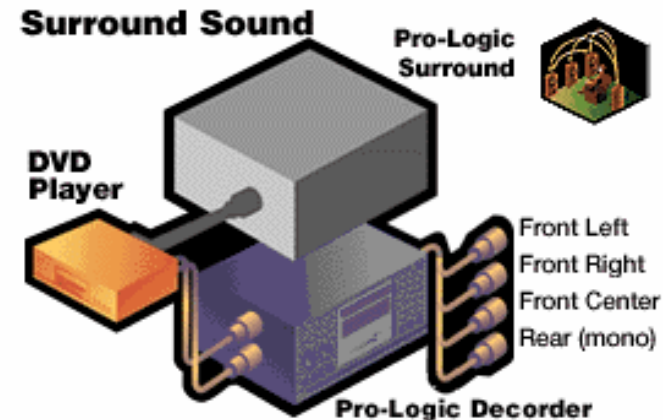
Karaoke with Dolby Digital(AC-3) 5-channel recording



Surround Sound



Surround Sound



Trends

- **2001: Over 90 million DVD-ROM drives worldwide**
- **2002: Over 140 million DVD-ROM drives worldwide**
- **IFA 2003 (August):**
 - DVD-Player: 50-Euro-Boom and DivX-Boom
 - DVD-Recorder with Flash-Cards
 - Digital Camcorder with 8-Centimeter-DVD
- **Manager Magazin:**
 - Philips is working on a Mini-DVD for Mobiles
- **Heise online:**
 - AeonDigital: first DVD-Recorder that is able to record with the more efficient compression Windows Media 9 (WM9).
- **HD-DVD: High-density formats: use blue or violet lasers to read smaller pits, increasing data capacity to around 15 to 30 GB per layer (2005/2006)**



Appendix



Appendix



- www.dvddemystified.com/dvdfaq.html
- www.dvdforum.org