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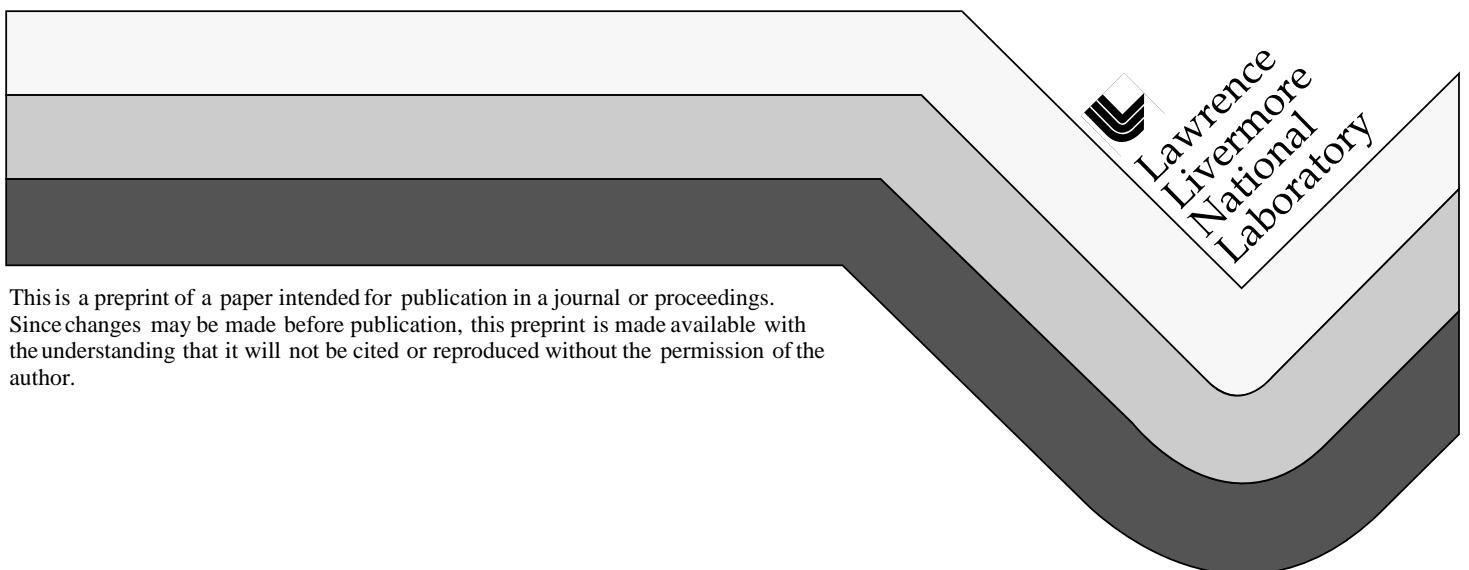
PREPRINT

# DVD - Digital Versatile Disks

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# DVD - Digital Versatile Disks

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An international standard has emerged for the first true multimedia format. Digital Versatile Disk (by its official name), you may know it as Digital Video Disks. DVD has applications in movies, music, games, information CD-ROMs, and many other areas where massive amounts of digital information is needed.

Did I say massive amounts of data? Would you believe over 17 gigabytes on a single piece of plastic the size of an audio-CD? That's the promise, at least, by the group of nine electronics manufacturers who have agreed to the format specification, and who hope to make this goal a reality by 1998. In this major agreement, which didn't come easily, the manufacturers will combine Sony and Phillip's one side double-layer MMCD format with Toshiba and Matsushita's double sided Super-Density disk. By Spring of this year, they plan to market the first 4.7 gigabyte units. The question is: Will DVD take off? Some believe that read-only disks recorded with movies will be about as popular as video laser disks. They say that until the eraseable/writable DVD arrives, the consumer will most likely not buy it. Also, DVD has a good market for replacement of CD-Roms.

Back in the early 80's, the international committee deciding the format of the audio compact disk decided its length would be 73 minutes. This, they declared, would allow Beethoven's 9th Symphony to be contained entirely on a single CD. Similarly, today it was agreed that playback length of a single sided, single layer DVD would be 133 minutes, long enough to hold 94% of all feature-length movies. Further, audio can be in Dolby's AC-3 stereo or 5.1 tracks of surround sound, better than CD-quality audio (16-bits at 48kHz). In addition, there are three to five language tracks, copy protection and parental "locks" for R rated movies. DVD will be backwards compatible with current CD-ROM and audio CD formats. Added versatility comes by way of multiple aspect ratios: 4:3 pan-scan, 4:3 letterbox, and 16:9 widescreen. MPEG-2 is the selected image compression format, with full ITU Rec. 601 video resolution (720x480). MPEG-2 and AC-3 are also part of the U.S. high definition Advance Television standard (ATV). DVD has an average video bit rate of 3.5 Mbits/sec or 4.69Mbits/sec for image and sound. Unlike digital television transmission, which will use fixed length packets for audio and video, DVD will use variable length packets with a maximum throughput of more than 10Mbits/sec. The higher bit rate allows for less compression of difficult to encode material.

Even with all the compression, narrow-beam red light lasers are required to significantly increase the physical data density of a platter by decreasing the size of the pits. This allows 4.7 gigabytes of data on a single sided, single layer DVD. The maximum 17 gigabyte capacity is achieved by employing two reflective layers on both sides of the disk. To read the imbedded layer of data, the laser's focal length is altered so that the top layer pits are not picked up by the reader.

It will be a couple of years before we have dual-layer, double-sided DVDs, and it will be achieved in four stages. The first format to appear will be the single sided, single layer disk (4.7 gigabytes). That will allow Hollywood to begin releasing DVD movie titles. DVD-ROM will be the next phase, allowing 4.7 gigabytes of CD-ROM-like content. The third stage will be write-once disks, and stage four will be rewritable disks. These last stages presents some issues which have yet to be resolved. For one, copyrighted materials may have some form of payment system, and there is the issue that erasable disks reflect less light than today's DVDs. The problem here is that their data most likely will not be readable on earlier built players.

For information on DVD, refer to the web pages at:  
[http://hydra.unik.no /%7ErRobert/hifi/dvd. \[sic\]](http://hydra.unik.no /%7ErRobert/hifi/dvd. [sic])

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