The World's First Movie Recording On a Preformatted Holographic Disc

August 27 2004

Optware Corp., the developer of Collinear Holographic* Data Storage System, announced today that it had achieved successfully **world's first recording and play back of digital movies on a holographic recording disc with a reflective layer using Optware's revolutionary Collinear Holography.** This is a major milestone for commercializing holographic data storage system.
The recorded movies were played back in a series of meetings from July eight through 12 with Optware's six existing investors as well as eight enterprises both domestic and overseas including leading manufacturers of electronic and electric products for consumer, business and industrial use. Company names are not disclosed.

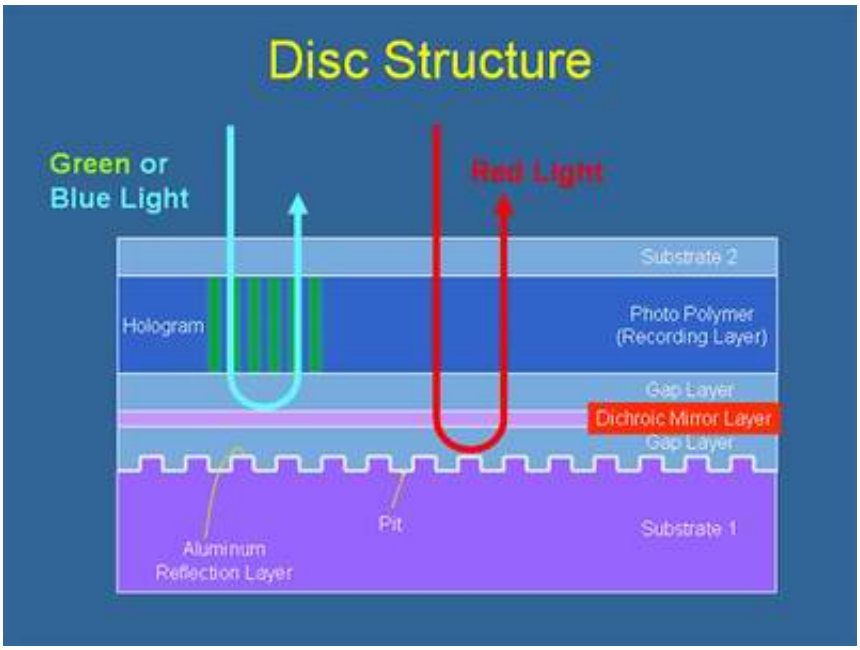
Technical details will be presented at "COST Action P8 (Cooperation in

the field of Scientific and Technical Research)", which will be held in Paris on September 16 and 17.

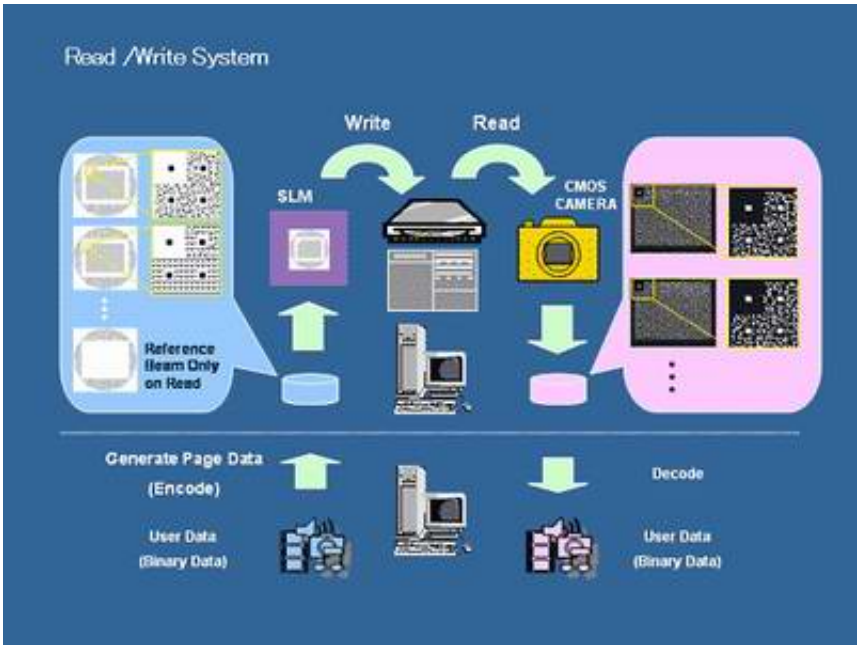
Top Image: Holographic Versatile Disc™ (HVD™) on which digital movies were recorded (left). The disc diameter of 12 centimeters is equivalent to those of CD and DVD.

Recording holographic page data** on a rotating transparent disc has been reported before. Such discs, however, are foreign to the conventional optical discs. Lacking the servo information, they do not seem to have a commercial viability.
On the contrary Optware has proposed Collinear Holographic recording on a hologram disc the structure of which follows conventional optical disc, i.e. preformatted disc with a reflective layer (disc with servo information).
This type of disc has been said to be inadequate because preformatted address pits generate diffusion noise during read / write, thus deteriorate the signal quality.
Optware has overcome this problem by applying a dichroic mirror layer between the recording and reflective layers. This dichroic mirror layer blocks the diffusion by the address pits, allowing ideal collinear holographic recording.

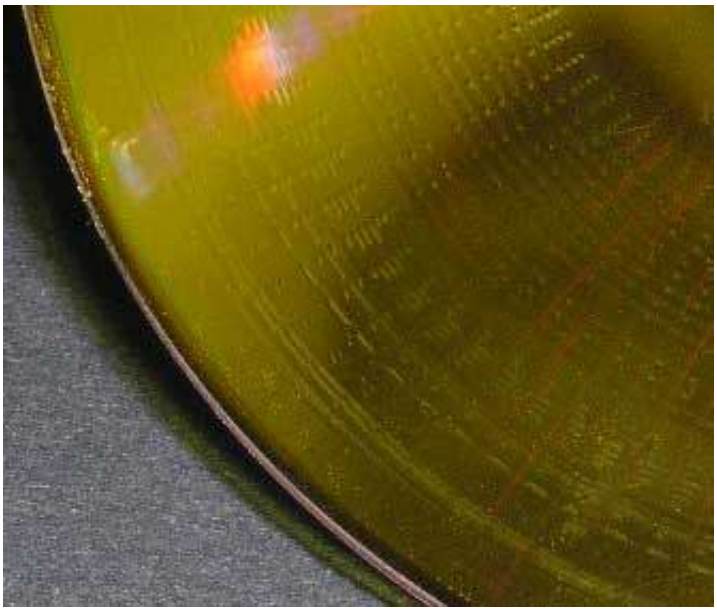
Optware's demonstration is an epoch-making event in a sense that it proved the successful integration of optical disc technology and holographic recording technology.



Optware&acutes Holographic Versatile Disc™ (HVD™) disc structure



Read / Write system



The surface of the Holographic Versatile Disc™ (HVD™). Multiplexed holographic data patterns are seen along the tracks.

Optware's holographic recording technology

Holographic recording technology records data on discs in the form of laser interference fringes, enabling existing discs the same size as today's DVDs to store as much as one terabyte of data (200 times the capacity of a single layer DVD), with a transfer speed of one gigabyte per second (40 times the speed of DVD). This approach is rapidly gaining attention as a high-capacity, high-speed data storage technology for the age of broadband.

Optware Corp. was established in 1999 as a development venture to find ways of incorporating holographic recording technology, seen as the heart of the high-capacity optical discs of the future, in commercially viable products. The Company's arsenal of valuable patents includes collinear holography, a technique that enables great simplification of optical systems.

* The collinear holography technique
Optware's exclusive development of the collinear holography technique is part of its effort to make holographic recording technology practical. A patented technology originally proposed by Optware founder and chief evangelist Hideyoshi Horimai, collinear holography combines a reference laser and signal laser on a single beam, creating a three-dimensional hologram composed of data fringes. This image is illuminated on the medium using a single objective. Using this breakthrough mechanism, Optware dramatically simplified and downsized the previously bulky and complicated systems required to generate holograms. Further enhancements were achieved with Optware's exclusive servo system. The introduction of this mechanism enabled reduced pickup size, elimination of vibration isolators, high-level compatibility with DVD and CD discs and low-cost operation, effectively obliterating the remaining obstacles to full commercialization.

** Page data
Two dimensional bit map image to be recorded and played back by hologram. Data to be written is first encoded to a series of page data, then recoded holographically.

Source: Optware

Citation: The World's First Movie Recording On a Preformatted Holographic Disc (2004, August 27) retrieved 12 October 2024 from https://phys.org/news/2004-08-world-movie-preformatted-holographic-disc.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.