DIGITAL STORAGE DEVICES

Device Name: 5.25" Optical Drive

Date Introduced: Both 5.25- and 12-inch versions were marketed around 1985.

Dates in Use: 1985 - present

Dimensions: They vary, approximately 8.3 in x 11.5 in x 2.8 in (W x D x H)

Variations and/or Identifying Features: They use light generated by lasers to record and retrieve information. They record information by altering the light reflectance characteristics of a given medium. A laser beam in the write mode heats the inner layer of the optical disc and thus changes the polarity of a magnetic coating. The resulting microscopic magnetic marks of different polarity can be read as a bit stream by a low-energy laser beam in the read mode.

Common Manufacturers/Brands: Pioneer, IBM, HP, Sony.

Associated Software: It needs none, as it basically acts as an external hard drive, especially when disks are bundled together in “jukebox” form.

Associated Media: 5.25" Optical Disk

Interface: They can be connected internally via IDE or SCSI and externally via SCSI, USB and FireWire.

Primary Usage: They are random access devices like hard drives. Although these

drives are not that popular in North America, they are widespread in Asia. The 3.5 inch drives are aimed at the consumer market, whereas the costlier 5.25 inch drives are used more by businesses for archiving.

Risks: Obsolescence is a huge risk factor with these, although newer higher capacity drives are supposedly also backwards compatible with most of the previous smaller capacity disks. Three chief concerns are:

• Data readability - refers to the ability to process the information on a computer system or device other than the one that initially created the digital information or on which it is currently stored. Typically, nonreadability involves some aspect of an older storage device (a tape or disk) that makes it physically incompatible with existing equipment. This "hardware obsolescence" occurs when storage devices and media used today become incompatible with those developed in the future.

• Data retrievability - means that identifiable records or parts of records can be selected and accessed. Accurate retrieval requires keys, or pointers, that link the logical structure of records (i.e., data fields, text strings, directories, and indexes) to the physical storage locations of the data on a disk. The optical digital data disk logical structure may have little relationship to the media and format involved. Usually, this linkage information is found in a file header, or label. The label may include information required to locate the beginning of a file, to indicate the number of bytes each record contains and where these bytes are physically located, and to distinguish among the various informational units of fields that form records. Typically, the interpretation of the record's logical structure is a function of the computer's operating system. Ensuring the long-term retrievability of records requires the continued functionality of the original operating systems or device drivers because these, too, are likely to become obsolete given enough time.

• Data intelligibility - means that the information a computer retrieves is comprehensible to another computer system or a human viewer. Intelligibility may occur at three levels. At its most simple level, intelligibility occurs when two computer systems either use or understand the same digital representation of the information, and this representation is translated into a form that humans recognize and understand. The second level occurs when two computer systems can use or understand the same representation of the information (e.g., ASCII), but when the representation is presented to users, it does not carry sufficient information (e.g., it is not self-referential) for a human to comprehend. Usually, this problem is associated with both coded and numeric data, and the intelligibility of such information can only be assured through documentation defining the values represented by the numbers and codes. The third level occurs when two different software applications, functioning in different computing environments, can process the same digital data and achieve identical results. One example of this is a text document embedded in one word-processing system that can be processed by a totally different word-processing system with no loss of information or page formatting details such as type fonts and line spacing. This lack of intelligibility becomes particularly evident when a proprietary encryption scheme is encountered or

when digital images are compressed based on a proprietary technique.[1]

Conservation Actions: Used and recycled drives can still be purchased at places like the website Recycled Goods (http://www.recycledgoods.com/used_drives.htm).

Resources:
http://www.research.ibm.com/journal/rd/405/asthana.html
http://www.viewz.com/shoppingguide/storage7.shtml
http://webworld.unesco.org/safeguarding/en/txt_opti.htm

[1] http://www.archives.gov/preservation/technical/digital-imaging-and-optical-disk-storage-report.html#s3

DIGITAL STORAGE MEDIA

Media Format: 5.25" Optical Disk

Media Type: Disk

Date Introduced: Both 5.25- and 12-inch versions were marketed around 1985.

Dates in Use: 1985 - present

Dimensions: 5.25 x 5.25 inch

Capacity: 600Mb – 9.1Gb
"IBM has been very active in defining the international standards. The first-generation rewritable capacity and format adopted by the International Organization of Standards (ISO) was the 650MB capacity for the 5.25-in. and 128MB capacity for the 3.5-in. optical cartridges. These capacity points are referred to in the industry as 1× capacity points for each of the two form factors. In this paper we refer to 1× , 2× , or 4× capacity points when discussing disk capacity, because this terminology can conveniently be applied to either the 3.5-in. or the 5.25-in. form factors. The second-generation standard (or 2× capacity), approved by ECMA in 1991 and submitted to the ISO, was the 1.3GB capacity for the 5.25-in. and the 230MB capacity for the 3.5-in. optical disk drives. The third-generation standard is 2.6 GB (or 4× capacity) for the 5.25-in. form factor, and it is likely to be > 500 MB for the 3.5-in. form factor".[2]

[2] http://www.research.ibm.com/journal/rd/405/asthana.html

Media Variations and/or Identifying Features: This is a hybrid of laser- and magnetic technology, the same later used in Sony's MiniDisc.

- Usually enclosed in plastic cartridges for protection
- Substrates may be metallic, glass, or plastic
- Information-bearing surface divided into tracks (like magnetic **disk**)
- Disks often combined into jukeboxes.
- Available in read-only and read/write configurations

Common Manufacturers/Brands: Philips, Sony, GE, Fuji, Olympus

Associated Hardware: 5.25" Optical Drive

Associated Software: It needs none, as it basically acts as an external hard drive, especially when disks are bundled together in “jukebox” form.

Primary Usage: In situations where random access to the data is subsequently required, they provide the ability for cost-effective data storage and transfer of large quantities of information, be it data, text, or image.

Risks: Most electronic media will be threatened by obsolescence of the hardware and software to access them. This often occurs long before deterioration of media (which have been subject to appropriate storage and handling) becomes a problem. As with most media, Optical Disks have been subject to a constant process of evolution and changes in manufacture. The quality of the media, a reputable source, and appropriate handling and storage environment will all affect its longevity.

Conservation Actions: Attention must be paid to the recording and access devices such as tape drives. These should be of good quality and well maintained, since problems with the access devices (e.g. head/media crashes) are one of the most common causes of damage to magnetic storage media. Since this storage device will soon become obsolete, migration appears to be the most reasonable action.

Resources:

http://www.medgrade.com/quick_compare.asp
http://en.wikipedia.org/wiki/Magneto-optical_drive
http://www.dpconline.org/graphics/medfor/media.html
http://www.bodley.ox.ac.uk/dept/preservation/information/audiovisual/optical/optical.htm