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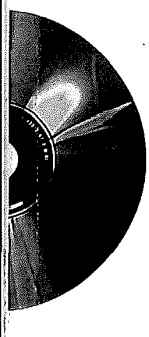
9TH EDITION



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Computer Desktop Encyclopedia

Ninth Edition

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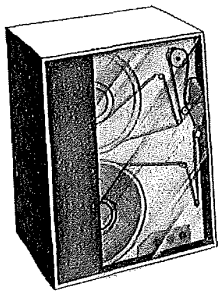
Half-inch reels evolved into half-inch, self-threading tape cartridges, including IBM's 3490/3490/3590 line, Quantum's DLT and StorageTek's Redwood, which hold from 800MB to 50GB. See *Magstar*, *DLT*, *Redwood* and *magnetic tape*.



Open Reel Tape
Although organizations have migrated to cartridge formats, legacy applications remain that still use open reels.

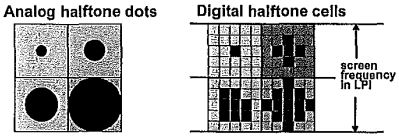
halftone In printing, the simulation of a continuous-tone image (shaded drawing, photograph) with dots. All printing processes, except for Cycolor, print dots. In photographically generated halftones, a camera shoots the image through a halftone screen, creating smaller dots for lighter areas and larger dots for darker areas. Digitally composed printing prints only one size of dot.

In order to simulate variable-sized halftone dots in computer printers, dithering is used, which creates clusters of dots in a "halftone cell." The more dots printed in the cell, the darker the gray. As the screen frequency gets higher (more cells per inch), there is less room for dots in the cell, reducing the number of shades of gray or color that can be generated.

In low-resolution printers, there is always a compromise between printer resolution (dpi) and screen frequency (lpi), which is the number of rows of halftone cells per inch. For example, in a 300 dpi printer, the 8x8 halftone cell required to create 64 shades of grays results in a very coarse 38 lines per inch of screen frequency (300 dpi divided by 8). However, a high-resolution, 2,400 dpi imagesetter can easily handle 256 shades of gray at 150 lpi (2,400/16).

PRINTER RESOLUTION & MAXIMUM SCREEN FREQUENCY

Cell size	Shades of gray or cols	At Printer Resolutions: 300 dpi	1,200 dpi	2,400 dpi
4x4	16	150 lpi	300 lpi	600 lpi
8x8	64	38 lpi	130 lpi	300 lpi
16x16	256	19 lpi	75 lpi	150 lpi



Analog vs. Digital
The analog world of commercial printing prints dots in varying sizes. The digital world prints in grids of dots. Increasingly, digital printers use techniques that overlap dots to achieve greater variability in dot sizes.

hammer (1) In a printer, the mechanism that pushes the typeface onto the ribbon and paper or pushes the paper into the ribbon and typeface.

(2) (Hammer) The code name for AMD's next-generation, 64-bit CPU chips. Expected in 2001, the Sledgehammer is one of the CPU models in the line. See *Athlon* and *Itanium*.

Hamming code An error correction method that intersperses three check bits at the end of each four data bits. At the receiving station, the check bits are used to detect and correct one-bit errors automatically.

hand coding Writing in a programming language. Hand coding in assembly language or in a third-generation language, such as COBOL or C, is the traditional way programs have been developed. In contrast, visual programming tools allow full applications or parts of an application to be developed without writing lines of programming code.

handheld computer A computing device that can be easily held in one hand while the other hand is used to operate it. The Palm devices are a popular example. See *Palm*, *smart phone* and *palmtop*.

handheld scanner A scanner that is moved across the image to be scanned by hand. Handheld scanners are small and less expensive than their desktop counterparts, but rely on the dexterity of the user to move the unit across the paper. Trays are available that keep the scanner moving in a straight line. Contrast with *flatbed scanner*, *sheet-fed scanner* and *drum scanner*.

handle (1) In computer graphics, a tiny, square block on an image that can be grabbed for reshaping.

PDA (Personal Digital Assistant) A handheld computer that serves as an organizer for personal information. It generally includes at least a name and address database, to-do list and note taker. PDAs are pen based and use a stylus to tap selections on menus and to enter printed characters. The unit may also include a small on-screen keyboard which is tapped with the pen. Data is synchronized between the PDA and desktop computer via cable or wireless transmission.

A PDA is like a palmtop computer except that the PDA typically uses a pen whereas the palmtop uses a small keyboard. Apple's MessagePad, more commonly known as the "Newton," was the first to popularize the concept. See *Palm*.

PDC (1) (Primary Domain Controller) A Windows NT service that manages security for its local domain. Every domain has one PDC, which contains a database of usernames, passwords and permissions. See *BDC*.

(2) (Personal Digital Communications) A digital cellular phone system widely used in Japan. Based on TDMA, it transmits in the 810–826MHz and 1,477–1,501MHz bands. PDC is a 2G wireless system. See *wireless generations* and *PHS*.

PD disk (Phase change Dual disk) A rewritable optical disk from Panasonic that uses phase change technology. Introduced in 1995, it uses 5.25" cartridges that hold 650MB and can withstand 500,000 rewrites. The PD drive also reads CD-ROMs, and the drive tray accomodates both PD cartridges and CD-ROM discs. The drive does not support Panasonic's earlier 5.25" phase change (PCR) cartridges. Panasonic's DVD-RAM drives also read and write PD disks. See *phase change* and *optical disk*.

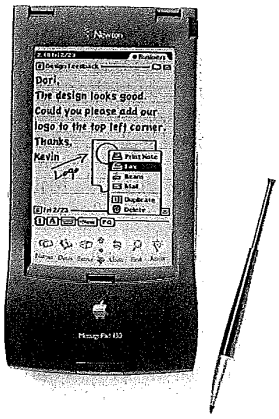
PDES (Product Data Exchange using STEP) A standard format for exchanging data between advanced CAD and CAM programs. It describes a complete product, including the geometric aspects of the images as well as manufacturing features, material properties and tolerance and finish specifications. For more information, visit http://pdesinc.aticorp.org. See *IGES*.

PDF (Portable Document Format) The page description language used in the Acrobat document exchange system. See *Acrobat* and *extension*.

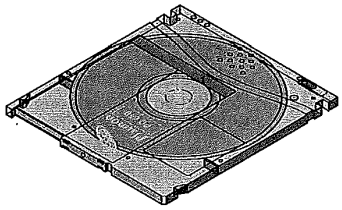
PDF417 (Portable Data File417) A two-dimensional bar code developed by Symbol Technologies, Inc., Bohemia, NY, (www.symbol.com). Created in the late 1980s, the standard was later placed in the public domain and is governed by the Automatic Identification Manufacturers (AIM) trade association. PDF417 is the most widely used 2-D bar code (more than one row of codes), and it can hold up to 1,800 bytes of any digital data in a printed area about the size of a business card. For bills of lading and applications that require more information, multiple bar codes can be printed. The scanner, which is made by Symbol Technologies and other companies, reads the bar code horizontally and vertically. MicroPDF417 is a denser version of PDF417 that takes up less space. It is used for marking small parts and can hold up to 300 bytes.

PDIAL (Public Dialup Internet Access List) A list of Internet service providers (ISPs) maintained by Peter Kaminsky. The last available PDIAL list is on various Web sites.

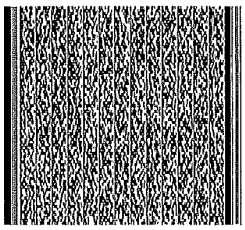
PDIP (Plastic DIP) See *DIP*.



The Newton
Although later taken off the market, Apple's Newton pioneered the PDA concept. *(Image courtesy of Apple Computer, Inc.)*



PD Cartridge
The PD cartridges look like and use the same technology as DVD-RAM disks. Panasonic's DVD-RAM drives read and write PD cartridges.



The Gettysburg Address
This PDF417 image contains the entire Gettysburg address. *(Image courtesy of Symbol Technologies, Inc.)*

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