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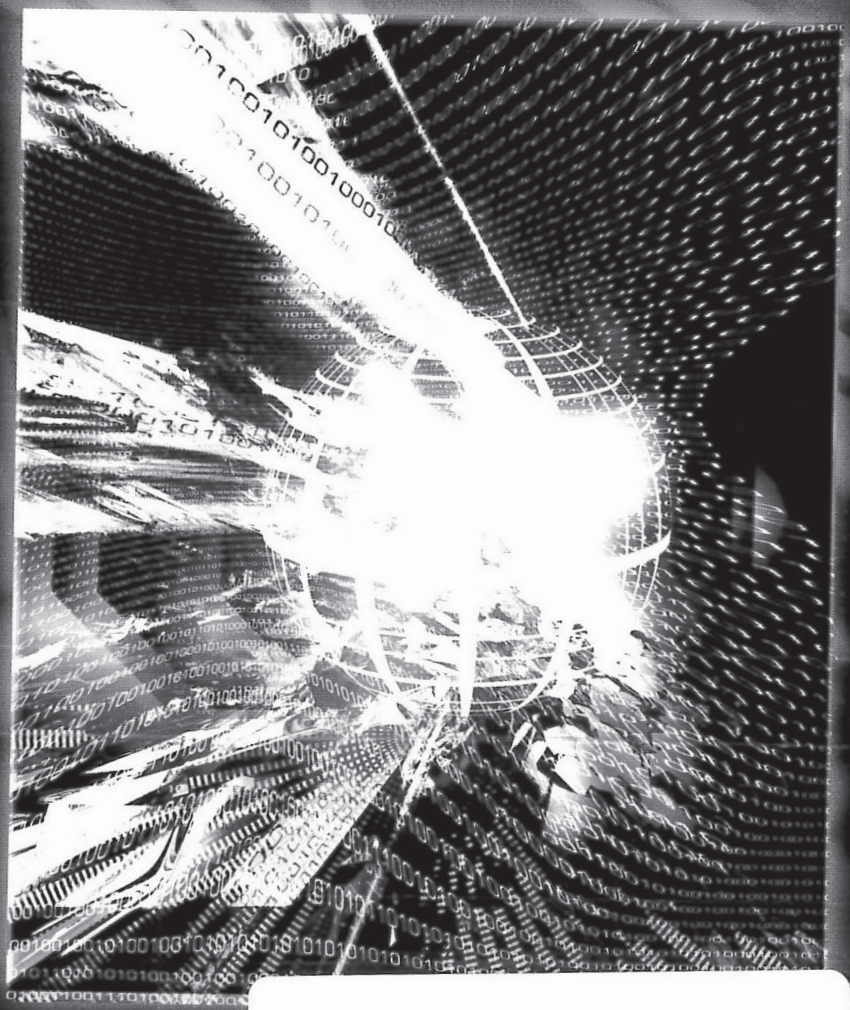
Quick Reference for Students and Professionals



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Computer Technology Encyclopedia: Quick Reference for Students and Professionals

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file control block (FCB) A component of an operating system that stored specific information about each file that was opened by the system. This information included such items as creation and access dates, permissions, pointers to sector locations, and ownership information. In the old days of MS-DOS, under the OS default, the user could open only four files at any given time. By adding a line to the *CONFIG.SYS* file such as FCBS=16,0 this number could be increased (to 16 in this example) up to 255 open files. While increasing this number allowed more files to be opened at once, it also decreased the amount of memory that remained available for programs once the OS loaded. Today's operating systems continue to use FCBs to represent files, but aren't under such restrictive limitations.

file filter An application that converts a file from one format to another. Documents created by one application might not be in the same format read by another application. For example, while Microsoft Word and WordPerfect are both very good word processors, they both use unique and different file formats. Fortunately, both include a file filter that allows a document from one to be used in the other.

file format The structure your data assumes while stored on the system. Technically speaking, all data on a system is nothing more than a string of 0s and 1s. The computer needs to know where one file ends and the next one begins. In addition to this very simplified information, it also needs to know what kind of file it is. Word processing documents contain a completely different type of information than a graphics or music file. An executable file is almost exclusively binary data and includes no text. A pure ASCII text file is the opposite. It contains nearly all text with virtually no control data. As such, nearly every file format is represented by one or more *extensions* specific to the format. Most people familiar with computers already recognize .JPG as being a graphic file and .MP3 as being a music file. Renaming a text file with an MP3 extension won't change the type of file it is so the music player can read you to sleep with the story you just wrote. The file format is completely different. Each file format is defined by a set of specifications that dictate how data is encoded and how file data is integrated from control data. Because a file is really nothing more than a container for data, the structure of the container dictates how the data is used by an application. This is why a word processing document by one brand of word processor might be unreadable to another word processor. *File filters* are frequently available to convert files from one format to another.

file striping *See* **bit striping**.

file system The mechanism used by a computer system to map the specific locations of information stored in nonvolatile storage. On the most basic level, the file system keeps track of the names of each and every file stored on the system. As such, the length and structure of a file name is under direct control of the file system. It is also directly responsible for keeping track of where all the data is stored. File systems keep track of physical locations as well as logical locations. A physical location would be the specific head, track, and sector where the first bit of data for a file resides. A logical location might be a pointer to a location. For example, file systems can locate files stored on a network server, but they can't store the information about that file in local file tables. All media require the

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A typical file system is hierarchical, meaning it defines the location of data in layers. In a hierarchical system, a hard disk can be divided into partitions, which subsequently can be broken up into directories. Multiple subdirectories reside beneath the primary directories and files can reside beneath any directory or subdirectory. The file system keeps entries for every piece of data stored on the system that includes a lot of information about each file. Such information includes the location of data as described, but it also can include information such as file attributes and permissions. Some file systems allow data to be compressed and decompressed on the fly and some allow data to be encrypted and decrypted on the fly.

File systems can be *journaling* or *versioning* in nature. A journaling file system gets its name because it keeps a journal of all files. Before a change to any given file is written to the system, the journal entry for that file is updated with critical changes, such as file size, sector locations, and so forth. A versioning file system allows a file to exist in multiple incarnations. When changes are made to the file and then saved, the original file is renamed and stored intact. This way if the user decides that the changes weren't for the better, she can go back to an earlier version. Most versioning file systems allow the user to configure how many versions to keep before overwriting the oldest version. Table F.4 lists a number of commonly seen file systems with a brief description of each.

TABLE F.4
File naming convention specifications

FILE SYSTEM	OS	FILE NAME LENGTH	DATABASE
FAT12	Microsoft	8.3*	File allocation tables
FAT16	Microsoft	8.3	File allocation tables
FAT32	Microsoft	255†	File allocation tables
NTFS	Microsoft	255	Master file table
HPFS	IBM‡	256	Metafile database
HFS	Apple	255	Unicode database
ISO 9660	Multi	Varies§	Descriptor database
UDF Plain	Universal	255	Block mapping
UDF VAT	Universal	255	Block mapping
UDF Spared	Universal	255	Block mapping with sparing table

* File name was limited to eleven characters, but a maximum of eight could be used for the file name, with three characters reserved for the extension.

† There were 255 characters included the file extension, which can be any length.

‡ Jointly developed between Microsoft and IBM, but IBM retained ownership after the partnership was dissolved. Early Microsoft products included some support for HTFS.

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