

Removable storage and back-up tools

What they are and what they can do

Every PC comes with a hard disk that can store a large amount of information, typically 40-60 GBytes of data (or about 200 000 copies of this document). Extra storage is needed for two purposes – to exchange data with other users or to keep back-up copies of files in case the ones on the PC become damaged.

Exchanging data

If the other person that you need to send data to is connected to a network, you can send them a copy of a file by e-mail. If you need to send data to others on the same internal network as you (e.g. an office network), a commonly adopted solution is to have a central specialised PC connected to your network, known as a **server**; this can be used to store all files that may be needed by more than one user. When it is necessary to physically transfer files from one PC to another and a network is not available, then there are a number of options.

Note that all of the options described below work more slowly than the hard disk in a PC and are therefore not generally a good way of storing working files. The only exception is where a file contains very sensitive material and it is better to be able to lock it away rather than to keep it on a PC.

Floppy disks are fitted to most PCs but can store only about 1.4 MBytes¹ of data. Their ubiquity makes them useful for storing small files but they are very slow and do not handle large files.



Zip drive and disk

High capacity floppy disks, such as the Iomega Zip drives, are also widely used. These can store (in the case of Zip drives) 100 Mbytes, 250 Mbytes or 750 MBytes and transfer information to and from a PC faster than floppy disk. The transfer rate is much improved if they are internal to your PC or if they have a Firewire or USB 2 (not ordinary USB) connection with your PC. They are a fairly common way of transferring information, especially image files. Similar drives are also available that can store 2 GBytes² of data, but these are expensive.

External hard drives that connect to your PC via a Firewire or USB 2 connection are becoming more common and affordable. These have the advantage that they can hold a lot of information (e.g. 180 GBytes) but can be taken away from your PC. They are probably more useful as a back-up to your PC than for exchanging data

CD-ROMs hold about 650 MBytes of data and, for some time, have been the standard way of distributing software and multimedia material. Most modern PCs can record (write) as well as play (read) CDs. There are two types of recordable CDs - CD-Rs (which can only be written to once) or CD-RWs (which can be written to many times). These form an excellent high-capacity, high-speed storage medium. CD-Rs can be read by almost any CD-ROM drive and can therefore be read by all modern PCs. CD-RWs can only be read by a PC fitted with a CD-RW drive. A CD-R is a good way of putting a presentation about your company onto a CD that can then be sent to clients.



CD drive

A more recent storage medium is the **DVD**. This can hold even more information than a CD-ROM – for instance, a complete feature film. Although many PCs are now fitted with DVD drives, there is not yet a single general standard for recording information on them and this limits their usefulness for data exchange.

¹ This is 1.4 million bytes of data and would be equal to about 10 copies of this document.

² A GByte (or Giga byte) is 1000 Mbytes

Key messages for SMEs

- Good removable storage media are essential if you need to transfer files to somebody who is not connected to your network or the Internet.
- A regular back-up routine is vital to protect your company's records and, hence, its survival.
- Good software and hardware tools exist at reasonable prices.



Tape drive

A storage medium that has been around for many years is **tape**. It is not often found as an attachment to PCs but is able to hold very large amounts of information - although it is not quick at retrieving individual files (think how long it takes to find an individual scene somewhere on a video tape!).

All of these storage devices come either as internal devices (which are fitted inside the case of your PC) or as external devices (which are connected by a cable to your PC). It takes more technical knowledge to install and set up internal devices but they are usually faster than external devices. If you want to use an external device, and have a more recent version of Windows than Windows 95³, buy a one with a USB 2 or Firewire connection, as this is much faster and easier to set up than ones that use the older serial or parallel connections.

Backing-up files

You should make a **back-up** copy of the information held on a PC at regular intervals (preferably daily, but at least weekly). If your PC fails, you have potentially lost all of your work since the last back-up. All of the devices described above can be used to create back-up copies. However, because floppy disks hold such a small amount of information, they are not really practical for making back-ups. Zip drives have been a common way of backing-up, but they are being superseded by CD-RWs or rewriteable DVDs. Tape drives are excellent back-up devices, since they can copy a large number of files with no intervention, but are expensive. Portable disk drives are also good, hold a lot of data and tend to be cheaper than tape drives

Where a server exists, a better solution is for all users to copy their files to the server, and then use a tape drive or second hard drive on the server to provide a further stage of back-up.

Software tools often come with the drives (of all types) to control back-ups. These will normally let you decide which files should be backed-up and allow you to set up the process so it takes place outside of normal working hours - but you must make sure that the entire back-up will fit on one tape, CD/DVD or disk if nobody is going to be present! These tools will also let you restore a good copy of a damaged file from the back-up.

Advantages and Disadvantages

There are occasions when files cannot be transferred over a network and some form of removable storage is needed.

CD-Rs/CD-RWs and floppy disks (and, increasingly, DVDs) are the most universally available devices, but floppy disks have their limitations. High capacity floppies are less limited, but are less universally available. Be aware that there may be incompatibilities between the DVD format you use to write and the DVD formats that can be read by the PC the data is being sent to.

It is sometimes more efficient to post a CD or DVD with large files on it than to try to transfer files over the Internet.

Tape drives can hold vast amounts of information but can be slow to retrieve individual files. Portable hard drives can store large amounts of data and are reducing in cost.

What to buy

Before buying any of these devices, read the PC magazines that are available in your country for reviews of what is available. Many of these also have websites that contain archives of earlier reviews. Two useful English language sites are <http://www.pcpro.co.uk> and <http://www.zdnet.com>. The FlexWork briefing on Equipment reviews will give you links to other sites.

Floppy disk drives are normally supplied as part of a PC and are rarely bought separately. The floppy disks themselves typically cost about €0.30 each

High capacity floppy disk drives (eg a Zip drive) cost from about €75 to €350, depending on their storage capacity. A disk for a 100 MByte drive costs about €10, that for a 250 MByte drive about €15 and that for a 750 MByte drive costs about €12.

³ i.e. Windows 98SE, 2000, ME or XP

Portable hard disk drives cost from about €150.

Most new **CD drives** can handle CD-R and CD-RW and cost between €0 and €50, depending on the speed at which they can read and/or write and whether they are internal or external devices. CD-Rs themselves cost less than €1 each and CD-RWs cost about €1.50 each.

DVD drives are often combined with CD-R/RW drives. These combination drives cost from about €150, while a separate DVD drive costs from about €100. A DVD drive that is capable of recording will cost about €300.

Tape drives cost between about €50 and €5,000 depending on their capacity and speed. The tapes for these cost between about €40 for a 10GByte tape to €160 for a 200 GByte tape.

Questions to ask suppliers

- What software comes with this device (or is needed) to make copying and backing-up files as simple as simple as saving them to my hard disc?
- Can the back-up operation be made automatic?
- What installation and operating instructions are provided?
- Can you install and set up the device for me?