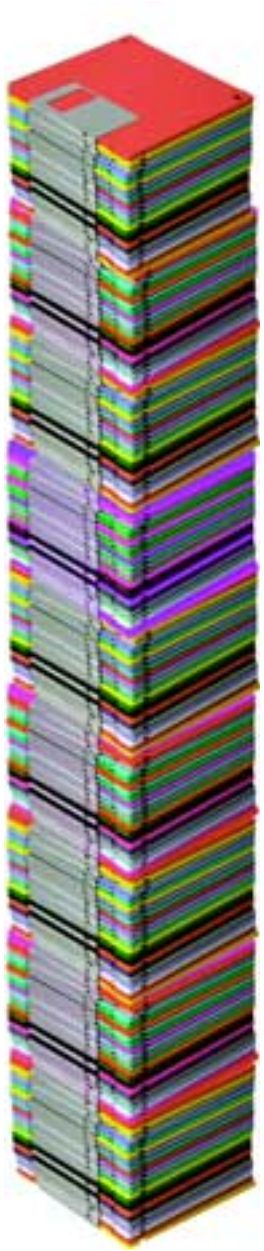
Removable storage



You'd think that now 20 and 40 GB hard disks are commonplace, most people would have ample space for files on their computers. However, as the capacity of hard disks has grown, the requirement for computer storage has kept pace. For example, a 60 minute video project can gobble up 12 GB of space – and that's not counting the raw footage which didn't make it into the final cut. Many people store their photos and music on their computer, and this too takes up a lot of space. Information is likely to need to be archived, backed-up and/or shared, and this is where removable storage comes in.

There is a range of options to help you back-up your important files. Products like the ORB and Peerless allow you to store gigabytes of information, while CD writers allow you to backup up 650 or 700 MB – and they have become cheaper and faster. Coming onto the market at the $1000 mark are recordable DVD drives which offer 4.7 GB of storage on one disc. There's a review of the Ricoh MP5125A recordable DVD drive on page 34.

In this article we're reviewed three high capacity disk-based storage options – Iomega's Peerless, Castlewood's 5.7 GB Orb drive and Maxtor's 3000LE, along with CD-writers from Iomega, Sony and Yamaha.

Removable storage – what's it for?

Removable storage allows you to free-up space on your hard disk by providing you somewhere you can store your files. It also provides you with a means for sharing your files with other people, ie. moving files from one machine to another.

If you're in business you're likely to want to keep records for future reference, or perhaps you're researching your family tree, in which case you may want to archive information for the future. Certain types of media are suitable for long term storage of your files; important if you have precious home video footage or photos you'd like to hang onto.

Computers crash and hard disk fail. Sadly, that's how it's going to be for the foreseeable future. Removable storage provides a way for you to make "backups" - emergency copies of your work for when something goes wrong with your PC. Because you can actually take removable storage media and keep it somewhere away from your main computer, you can protect your files even if your computer is destroyed by fire or stolen.

You may have content or files that's either very important or not suitable for minors – removable storage means you can keep it locked away where it can't be accessed by unauthorised users.

With CD-writers, you can also make your own music CDs which can be played in most music CD players, or you can make Video CDs with your home movies, which can be played on your PC and on some stand-alone DVD players.

Types of storage

There are several different types of removable storage available:

- **Removable disks** – hard disks in protective removable covers. They work like a floppy disk drive, but can store a lot more information. The most widely used is the Iomega Zip. The Orb and Peerless are higher capacity examples.

  You can use a removable disk just as you would a hard disk or floppy disk - you can 'drag and drop' files onto them. This type of disk is ideal for transferring and backing up information.
- **CD-R (CD-Recordable)** and **CD-RW (CD-ReWritable)** discs are a great solution for those needing to backup or archive reasonably large amounts of data. You'll need a CD-writer drive with these discs. They are often called CD burners because they use a low power laser to 'burn' pits in a layer of dye on the disk.

  With a CD-R disc, information can be saved onto the disk, but once there it can't be changed. With a CD-RW disc, information written to a disk can be erased, and rewritten. When they were first launched, drives could often only use CD-R discs, however these days drives will use either type.

  CDs are good for sharing large files – because just about every computer user can use them in their existing CD-ROM drives.
- **Tape drives** were once the only option for serious backing-up, now they're more relevant where there is a very large amount of data. Their inflexibility makes them less attractive for home and small office users.

What to look for

- **Size (capacity)** – the de facto standard in removable disk storage is the Iomega Zip disk. With the latest release you can store up to 250 MB of information (the older version could hold 100 MB – 250 MB drives can use 100 MB disks, but not vice versa). A recordable (or rewritable) CD can store 650 MB. The Orb drives come in two capacities – 2.2 GB and 5.7 GB versions. The Peerless can hold up to 20 GB, and the Maxtor is a huge 120 GB.
- **Media cost** – of course how much the media (the disk or cartridge the information is stored on) costs

is important. For a true idea of cost, you need to factor in the capacity of the media. In our reviews we tell you the cost of the media, and the cost per megabyte of storage.

- **Durability** – unprotected media such as CD-R or CD-RW is vulnerable to scratches, but has a long life if stored in good conditions and carefully handled – according to the manufacturers we've spoken to this is somewhere between 50 and 100 years depending on the brand of media. It's ideal for archiving. Media such as Zip and Orb disks are encased in a cartridge, which makes them more robust for day-to-day handling.
- **Sharing** – if you want to share your files with others, it's important that they can deal with the media you've used. Most CD-ROM drives can read CD-R discs, so they're ideal for distributing your computer files (the media is also cheap, so you don't have to worry about whether you'll get it back or not).
- **Speed** - this depends on the media type, the way the device connects to your computer and how speedy the particular device is. In the tests we timed how long it took to copy data to and from each device.
- **Computer connection (interface)** – you need to make sure that your computer has the right type of connection or "port". However, not all connections are equal. Devices that rely on the parallel port (usually used for printers) are very versatile, because they'll work on quite old computers. However, they are slow. At the other end of the spectrum, drives which connect internally to your computer's hard disk IDE connector (found on the main circuit board inside your computer) can be very fast. A speedy alternative to IDE is to use a SCSI connection. This can be either internal or external, but most PCs aren't fitted with a SCSI port and so need extra circuitry installed (on a `card'), the devices themselves also tend to be more expensive.

  The Universal Serial Bus provides very easy connection to your PC, because all recent PCs have the required USB sockets, though it is slow. Faster connections are available using USB 2 (High Speed USB), FireWire or SCSI, but all these are likely to require a 'card' fitted in your computer.

How much space?

Computer storage is measured in Bytes (B) - roughly the equivalent of one character. Typically a modern computer will have a hard disk which will store 10 or 20 gigabytes (GB) – approximately 10 to 20 million bytes. One megabyte (MB) is one million bytes (1,024,000 to be precise).

About our test

We used a 600 MHz Celeron with Windows XP to test these devices. Note the scores can only be used to compare these storage devices with each other – they aren't on the same scale as our previous test of CD-writers. To test speed we copied 525 MB of data (with a mix of file sizes) from the computer's hard disk to the storage device, and then copied it off again – timing each transfer. To test a disk for editing video, we checked to see whether it was fast enough display a smooth real-time preview using Ulead VideoStudio 6 – this is a function which requires a very fast hard disk. You can edit without using this feature, but it makes checking your final assembly much easier.

Castlewood Orb

ERP: $849
Capacity: 5.7 GB
Works with: PC – Pentium-class, Win98/Me/2000/NT4; Mac – PowerMac G3 or G4, Mac OS 8.6+
Media cost: $149
Cost per MB: 2.6c
Speed rating: 8/10

This **Orb** system uses cartridge disks, a bit bigger than a floppy disk. This drive is internal, it fits in a drive bay in the computer, and connects to an IDE connection. This is the connection used by hard disks, CD-ROMs and CD-writers. For maximum speed install the Orb as a "Master" device.

Once installed, the Orb behaves much the same as a high capacity floppy drive – you can format it, copy files to and from it, etc.

Though it's fast enough to play back movie files directly from a disk, it was not fast enough for us to comfortably edit videos from an Orb disk.

The main thing the Orb has going against it is that is has a relatively small user base, so you won't easily be able to swap disks. If you want to do this, you would be much better off with an external Orb drive, since you can easily set that up on other computers.

Bottom line: A good product for those working with large files such as video. The media is quite expensive.

Iomega Peerless

ERP: $1099 (for both FireWire and USB) with 20 GB cartridge
Capacity: 20 GB (tested), 10 GB also available
Works with: PC – Pentium 100, Win98/Me/2000; Mac – iMac/PowerMac, Mac OS 8.6 through 9.x
Media cost: $489 (20 GB), $379 (10GB)
Cost per MB: 2.4c (20 GB)
Speed rating: 9/10

The **Iomega Peerless** system consists of a dock, a power supply and a cartridge (our test one was 20 GB). It connects to the computer via USB or FireWire. We tried both, and can only recommend the USB version if you don't mind very slow transfer speeds. The FireWire version is much faster. It took just three minutes to transfer our 535 MB test files. It's fast enough for you to play video files directly from the disk, though it wasn't fast enough for video editing with our test system. We found the Peerless operated much faster when we selected ***Optimise for performance*** in its ***Properties***.

The Peerless is very easy to set up – the cradle simply plugs into the computer's USB or FireWire port. Our Windows XP test system detected the Peerless automatically, and did not require any additional drivers.

Bottom line: Large storage capacity and high speed make this ideal for those who dabble in video editing, and others who require large amounts of storage. Media is quite expensive.

Maxtor 3000LE

ERP: $999.95
Capacity: 120 GB
Works with: PC – Pentium II, Win98SE/Me/2000/XP, 32 MB RAM; Mac – G3 or better, OS 9.0, 32 MB RAM
Media cost: Drive is removable, not media
Cost per MB: 0.8c
Speed rating: 9/10

The **Maxtor Personal Storage 3000LE** is a hard disk in a box. It offers a massive 120 GB of storage – roughly the same as 190 CD-ROMs.

It connects to the computer via a USB connection – both USB 1 and USB 2 are supported. Though, to be honest, don't bother with USB 1, it's just too slow except in an emergency. With USB 2, the 3000LE the file transfer is very fast – taking just under two minutes to copy our 525 MB test files. Though, while we had no problems playing video files from the 3000 LE, it wasn't fast enough for us to edit video footage from the drive itself.

Because USB 2 is relatively new, it's unlikely your computer has it, and you'll need to invest in a USB 2 card (see page 35).

Unlike the other products we've looked at, you can't add more disks or cartridges for extra storage. When you fill up the 120 GB, you'll have to buy another drive.

Bottom line: Though not removable media, this removable disk is a good choice for users with large amounts of data to get off their hard disks.

Iomega CD-RW

ERP: $399
Capacity: 650/700 MB
Quoted speeds: 32x (CD-R), 10x (CD-RW), 40x (CD-ROM)
Works with: Pentium 166, Win95/98/Me/NT4/XP
Media cost: $1.20 (CD-R)/$3 (CD-RW)
Cost per MB: 0.2c
Speed: 7/10

This is a speedy internal CD writer from Iomega. There's a manual on the accompanying CD, as well as a quick install pamphlet, which does a good job of explaining the process.

Iomega says you can copy a 650 MB CD in less than four minutes; our 525 MB test files took three-and-a-half minutes to copy to a CD-R.

The **Iomega CD-RW** incorporates a 2 MB buffer and "BurnProof" to ensure a steady stream of data is sent to the drive as the CD is recorded. These features help to minimise the number of faulty CDs. It's supplied with the excellent Nero Burning ROM 5.5 CD writing software, and InCD packet writing software.

A 40x speed version was announced at the time of going to press, so there may be a faster version of this drive on the shelves by the time you read this.

Bottom line: A fast and straightforward CD-writer with a good software package.

Sony CRX1750MU

ERP: $499
Capacity: 650/700 MB
Quoted speeds: 24x (CD-R), 10x (CD-RW), 40x (CD-ROM)
Works with: Win98SE/Me/XP/2000 or Mac OS 9.0.4, 9.1, 9.2.1
Media cost: $1.20 (CD-R)/$3 (CD-RW)
Cost per MB: 0.2c
Speed: 7/10

Like the Maxtor, this uses a USB 2 connection – though it will work at a reduced speed with USB 1.

Being a USB device, the **CRX1750MU** is very easy to set up. With our Windows XP computer, it was automatically recognised when plugged in.

In terms of speed this is a quick 24x speed drive – the manufacturer claims it can write a 650 MB CD in 3.7 min (when writing from a disk image on a hard disk). It has a rewrite speed of 10x. In our test, it copied our 525 MB test file onto a CD-R in about three-and-a-half minutes. Anti-buffer-underrun technology helps avoid making faulty CDs.

Like many Sony peripherals, this device has a Memory Stick slot for transferring files.

The CRX1750MU comes with a good range of software including Bi Recording Gold (CD recording software), B's Clip (packet writing software) and Retrospect Express (backup software).

Bottom line: A good option for those with USB 2 (or those who don't mind adding an additional USB card to their computer).

Yamaha 3200E-VK

ERP: $349
Capacity: 650/700 MB
Quoted speeds: 24x (CD-R), 10x (CD-RW), 40x (CD-ROM)
Requirements: 300 Pentium II, Win95/98/98SE/Me/XP/2000, 32 MB RAM
Media cost: $1.20 (CD-R)/$3 (CD-RW)
Cost per MB: 0.2c
Speed: 7/10

This 24x internal CD writer from Yamaha is big on features. It incorporates two systems to help you avoid making "coasters" (faulty CDs) – a large 8 MB buffer and SafeBurn technology which allows the drive to continue burning after it's been interrupted.

The CRW3200E-VK did well in our speed test, being able to copy our 525 MB test files in well under four minutes.

The CRW3200E-VK supports the new packet-writing format CD-MRW.

If you're planning to make audio CDs, you may find "Audio Master" a useful feature. When this is enabled, the system widens the 'lands' and 'pits' of the CD-R, reducing the jitter created during recording, and improving the audio quality of the finished music CD.

The drive comes with Nero Burning ROM 5.5 – one of the better CD-writing programs around, packet writing program InCD and NeroMIX (an audio CD-writing program).

Bottom line: Speed and a full set of features make this a good choice for the discerning buyer.