Technofile: digital camcorders

Perhaps the most revolutionary digital medium, digital video places high quality and easy editable footage in the hands of the home film maker. In our first in a series of *Technofile* hardware overviews, Jonathan Parkyn assesses the prime movers in this market, suggesting the best choices for all home video needs

When most of us think about home movies, we are reminded of sitting through hours of tedious, fuzzy footage, forced upon us by an enthusiastic friend or relative. A classic case of analogue video blues. Although popular in their time, traditional analogue video camcorders only offer limited image and sound quality, and footage is awkward to edit – all of which can add up to some pretty dire amateur films.

In contrast, the current generation of digital camcorders can produce high-quality footage, include in-camera special effects and even connect to your computer to transfer film so you can edit out anything you don't like. All this gives you everything you need to create professional-looking movies from your desktop. Indeed, DV-produced features have even begun to appear at the more experimental end of cinema billings.

In this month's *Technofile* we'll be focusing on some of the latest camcorders, comparing them on criteria such as ease of use, compatibility, picture quality and extra features. Almost all of them use the popular MiniDV format, though we have included a few variations on the digital theme.

Beginners

At the low end of the market you can expect to pay anything from just over £500 to around £700 for a DV (digital video) camcorder. However, at these prices you'll have to sacrifice a few features. Both the Sony DCR-TRV15E and the Panasonic NV-DS27B budget models, for example, look and feel like cut-down versions of more advanced cameras.

Aside from all the standard features that you'd expect, these two camcorders come with little more than a Night Shoot function – a gimmicky feature that allows you to film in the dark with a kind of eerie, green CCTV glow. While both lack memory card slots and megapixel-quality photo capability, they do allow budget users access to great-quality digital video recording. The Sony camera is characteristically sleek and a touch lighter than the Panasonic, although the latter has a better optical zoom at 15x.

Closer scrutiny

Be careful when looking at zoom lengths, though. The JVC GR-DVX44EK claims a massive 300x digital zoom. This doesn't ensure a good picture, however – digital zooms severely compromise picture quality, just as they do on digital still cameras, so keep your eyes on the optical zoom figure.

In the case of the GR-DVX44EK, this is a somewhat less impressive 10x. But it

← The Canon MV400i is exceptionally good value with a great range of features, including the all-important DV input socket

does have some nifty digital effects, such as a range of in-camera fades and wipes that can be applied to your footage. Its real bonus, however, is its size. It employs the 'upright brick' build style that has become quite common in the DV world. Unfortunately, it looks a little retro with its squared-off edges and plain body.

By far the best model in the budget section is the Canon MV400i. It's small without adopting an upright design and exceptionally light. Crucially, it's also easy to operate, fitting snugly into the palm of your hand. It's not the flashiest of cameras, but it includes one all-important feature – an input-enabled DV socket.

Cut and dry

If you're not intending to do much editing this probably won't mean much, but a two-way DV connection is vital for those wishing to cut together a movie using PC editing software. Most digital cameras feature a DV port, but many budget models will only allow you to output your footage digitally to your computer.

When you've finished editing your work, you'll usually want to output it from your PC back to tape again so you can show it to people. For this you'll need the camera's DV port to work both ways. Even if you just want to output to VHS, you'll need your DV camera to be able to act as a conduit that converts the digital data from your computer into a standard analogue video signal for a VCR.

Sadly, the addition of an input-enabled DV port means a slightly higher price tag. Indeed, Canon produces a version of the camera (the MV400 – note no 'i') without DV-in that sells for nearly £100 less. That said, the MV400i is still one of the best-value MiniDV camcorders on the market.

As an additional bonus, the MV400i also has an analogue S-Video input socket – something usually unheard of outside the top-end of the market. This means that you can also record to DV tape from a VCR or even the TV. This could come in particularly handy if you have older home movies that you want to convert to DV tape.

Editing on your PC

One of the most attractive aspects of digital video is that it can easily be transferred to a PC and edited using a dedicated video application. Here are few pointers on how to turn your reams of footage into a slick mini movie.

First of all, make sure that your PC is up to the job. You'll need a reasonably fast processor (700MHz at least) and bags of memory and disk space. It's also likely that your PC will need some extra hardware. Virtually all MiniDV cameras have a DV (digital video) port, but you'll need a corresponding socket on your computer, which will mean installing a FireWire card.

Once you've sorted out your hardware and transferred your footage to disk, you'll need a special program to edit your masterpiece. At the top end are products like Adobe Premiere 6.0 (www.adobe.co.uk) and Ulead MediaStudio Pro 6.5 (www.ulead.com), which cost between £400-£600. However, although they're choc-full of features, they can be quite complicated and their cost alone may have already put you off.

If you want something a little more basic, then they don't come much simpler or cheaper than the Movie Maker package that comes imbedded in Windows Me and XP. The options on offer here are quite limited, however, and it won't be long before you start hankering after something a little more advanced.

As a program that's capable of growing with you while you learn the ropes, we'd recommend MGI VideoWave 5.0 (www.mgisoft.com) which costs about £80. It uses a linear storyline for arranging your clips and, while basic operation is straightforward and intuitive, the wide feature set means that you'll soon be experimenting with more advanced techniques. VideoWave also allows you to output your finished film directly to CD, DVD or to the web.

There are also some interesting editing products available from Adaptec (www.adaptec.com), Pinnacle systems (www.pinnaclesys.com), and Matrox (www.matrox.com).

Upgraders

An attractive solution for those upgrading from analogue is Sony's DCR-TRV230E. This camera differs from the others that we tested in that it uses a tape standard called Digital8. The DCR-TRV230E can also use Hi8 cassettes, an analogue standard that it records to digitally.

Sony claims that this doesn't result in any quality drop-off, although we did notice that the picture taken with this camcorder was slightly less crisp than that of some of the MiniDV camcorders we looked at. But this could be down to the smaller CCD (charge-coupled device) image sensor that is used in the device. Most DV camcorders use a 1/4in CCD, whereas this camera has a 1/6in sensor.

Old style

The DCR-TRV230E is heavy and old-fashioned looking, partly because Digital8 and Hi8 are much larger formats than MiniDV requiring a bigger housing and tape mechanism. However, it's also cheap and the format versatility makes perfect sense for those who want to go digital but still have loads of old Hi8 recordings and cassettes that they want to carry on using.

The DCR-TRV230E comes packed to the hilt with features. Equipped with a DV port (albeit output-only enabled), Super NightShot for filming in the dark and an enormous 25x optical zoom, it also has many in-camera effects, such as widescreen settings, wipes and fades.

Like the rest of the machines in the budget group, it doesn't have a dedicated memory card slot for taking still pictures but you can record still images to tape and output them to a digital printer or a PC.

Enthusiasts

MiniDV is actually the compact version of standard DV – a format used in professional equipment. Measuring a little over 2.5in across, MiniDV tapes are conveniently small, which has meant that many camcorder manufacturers have been able to produce some attractively petite models. However, shrinking the technology has exacted its own price, and many of the smaller models are more expensive.

Small wonder

Take the Sony DCR-PC9E, for example, the smallest (and coolest) camcorder in this test by a long chalk – but then at over £1,000 it should be. It's little bigger than a pack of cards, and will fit snugly into a handbag or a generous pocket. Its multitude of settings and effects can all be accessed from the camera's 2.5in fold-out LCD panel, which doubles up as a touchscreen menu navigation system. This makes the PC9s body mercifully free of buttons but has the slightly unfortunate side effect of forcing you to use the screen, which can drain the battery.

When we first looked at this camera in the October 01 issue, we had some reservations about its £1,300 price tag. Now it's going for around £150 less, it looks a lot more attractive. It might not have quite the class of professional cameras, but its picture quality is unsurpassed at this price point. Combined with its size and a bi-directional DV port, the DCR-PC9E is hard to beat in the Enthusiast category.

Double exposure

Mid-range camcorders commonly include an extended set of still photo features. The DCR-PC9E, for instance, comes with a slot for Sony's own Memory Stick and a 4MB card is provided for storing photos.

Although neither the JVC GR-DVL557 nor the Sharp VL-ME10H features megapixel-quality stills photography, both have slots for Multimedia SD (secure digital) cards. These two cameras are larger and cheaper than the Sony, and the similarities between them don't end there – if you put the two cameras side by side you'd be hard pressed to tell them apart.

← The Sony DCR-PC9E is small enough to fit snugly in to a pocket, but also contains a good range of features. The only down side is its high price

→ The Hitachi DZ-MV100A uses DVD-RAM discs rather than tape media, but we suffered from compatibility problems

The size and shape of the outer casing, tape-loading mechanism and arrangement of buttons, functions and features are virtually identical.

Peripheral vision

However, there are some differences. The JVC model comes with a front-mounted lamp for filming in poor light conditions, which is useful although it's a long way from the kind of lighting that's required for good, even illumination. The lamp also drains battery life swiftly, especially when used with the unit's enormous (3.5in), fold-out LCD viewscreen.

Also present on the JVC model is an accessory shoe for mounting external microphones, lamps and the like. However, the Sharp VL-ME10H holds its own with another large (3in) LCD monitor and a better mounting for its built-in microphone.

Overall, it's the JVC model that wins this midfield tussle, quite simply because it comes with an input-enabled DV port, like the Canon MV400i and the Sony DCR-PC9E. Sharp neglected this important feature which, in a camcorder that's pushing the £900 mark, is regrettable.

Disc-topia

The Hitachi DZ-MV100A doesn't need anything as crude as FireWire cables, since it uses mini DVD-RAM discs instead of tape media. This is a rewritable DVD format similar to that used in many PC-based systems and set-top video recorders, although you can only read it in these drives if it is single-sided, and can be removed from its cartridge.

The idea is that you record footage to a DVD-RAM disc and then pop it straight in to your computer to access the digital video files. Each double-sided 8cm disc can hold up to one hour of top-quality

footage, which is similar to MiniDV cassettes, though the image quality doesn't seem quite as good as on traditional DV tape.

The format's major drawback, however, is compatibility. Our mini-DVD disc failed to be recognised by the three DVD-ROM drives and the standalone DVD player that we tried to read it on. The instruction book suggests that you can only read the discs in drives that conform to the DVD-RAM standard, but this seems to rule out many systems.

Aside from this, the slightly heavy camera acquits itself well, with a handsome set of features and the unique capability of being able to record video and images to DVD from an external AV source. Nevertheless, recordable DVD is still in its infancy and until the format wars die down or the technology becomes cheaper, the DZ-MV100A may be little more than an expensive novelty.

→ Seeing its way to the top of the range, the Canon MVX1i gives the best pictures of the single-CCD devices

Professional

Better image quality, a wider range of features and more compact technology are available at the high end of the market. Amateur filmmakers might eschew DV altogether, heading instead for professional cameras that use formats such as DVCam, DVCPro or even Digibeta. However, you'd be hard pressed to find this kind of equipment for less than £3,000.

The real key to a more professional look to your videos lies in the camcorder's image sensor, or CCD. Most of the cameras here are intended primarily for home use and, as such, compromise by using only one CCD to do all the hard work. Filmmakers with more ambition might want to look for models that feature three separate CCDs, like those that are used in broadcast TV.

We three chips

Sharing colour duties between three sensors results in a noticeable improvement in image quality. While still expensive, the Panasonic NV-MX300B is one of the few 'three-chip' miniDV cameras to fall below the £2,000 mark. It's a robust, compact device that takes a tremendously good picture. This is undoubtedly also helped by its Leica Dicomar lens.

The camera includes just about every feature you'd ever want, such as DV-in/out, analogue AV inputs and manual controls. It also features an optical image stabiliser, which works much better than the electronic ones included on cheaper models. Still images can be taken at 1.8Mp (megapixel) quality and stored on a removable SD memory card.

Bottom heavy

However, the NV-MX300B has one fatal flaw: to save space, its tape loading mechanism is on the unit's underside. While this is largely unimportant at the lower end of the market, videographers wishing to use a tripod or similar support device will find that they have no access to the tape bay while filming.

Unfortunately, the phenomenon of 'bottom-loading' is widespread and both of the other units in our pro section suffer this problem. However, with only one CCD each, the Sony DCR-PC120E and the Canon MVX1i are not aimed at the same semi-pro crowd as the NV-MX300B. Very much boys' toys, the DCR-PC120E and the MVX1i are compact, upright camcorders that come bulging with snazzy features. Both have attractive designs and are capable of excellent image quality. The Canon model, particularly, seemed to record footage at just about the best quality we've seen on a single-CCD model.

But it's the Sony camera that really has all the tricks up its sleeve. The DCR-PC120E has been rebranded as a Network Handycam, emphasising its Bluetooth capability. This allows you to exchange data wirelessly with another Bluetooth device, such as a PC. Bluetooth is an emerging technology and at the moment there aren't many devices that use it. However, with the bundled Bluetooth modem adaptor you can use the DCR-PC120E to connect to the internet (using the 2.5in fold-out screen), send and receive emails and even post still photos and mini Mpeg movies online.

The Canon MVX1i seems a little pedestrian in comparison, regardless of its identical asking price. That's not to say that it isn't worth looking at. In fact, we'd recommend it on its quality and features alone, although we'd suggest that you test it out in your own grip before you buy, as its heavy build may not be universally suitable.

Verdict

Image quality is always going to be important for those who are serious about their video, so we'd recommend the Panasonic NV-MX300B with its three CCD sensors for buyers with a top-end budget.

If you want a good, feature-packed, compact model, then why not look at the Sony DCR-PC9E in the mid-range or the Canon MVX1i if you've got a bit more money. Just make sure that they fit properly in your hand and that you'll feel comfortable holding them for long periods.

The clear winner in terms of price is the Canon MV400i. It is easy to use and takes a great picture for such a cheap model. Most important of all, it's ready to use with your PC, should you want to dabble in a spot of desktop editing. ■

Features comparison

Product	Contact details	Price (ex VAT)	Format	Dimensions	Weight (W x H x D)	DV-in/out	LCD screen	CCDs	Zoom	MultiMedia card	Megapixel still photo	Image stabilizer	Good points	Bad points	Ease of use	Build Quality	Performance	Features	Value for Money
BEGINNERS																			
Canon MV400i	Canon: 0800 616 417 www.canon.co.uk	£670	MiniDV	57x102x 134mm	540g	In/out	2.5in	1x1/4in	10x optical, 200x digital	N	N	Y	Good value, light, easy to hold/	Feels a bit plasticy operate, S-Video in/out	8/10	8/10	8/10	8/10	10/10
JVC GR-DVX44EK	JVC: 0870 330 5000 www.jvc-europe.com	£700	MiniDV	51x120x 97mm	470g	out	2.5in	1x1/4in	10x optical, 200x digital	N	N	Y	Small, loads of effects, wipes	Ugly, no DV-in and settings to play with	6/10	6/10	6/10	8/10	7/10
Panasonic NV-DS27B	Panasonic: 0990 357 357 www.panasonic.co.uk	£550	MiniDV	77x96x 179mm	680g	out	2.5in	1x1/4in	15x optical, 600x digital	N	N	Y	Long optical zoom	Low on extra features	8/10	8/10	8/10	7/10	9/10
Sony DCR-TRV15E	Sony: 0990 111 999 www.sony-europe.com	£700	MiniDV	74x95x 175mm	610g	out	2.5in	1x1/4in	10x optical, 120x digital	N	N	Y	Good value, light	Low on features	10/10	8/10	8/10	7/10	8/10
Sony DCR-TRV230E	Sony: 0990 111 999 www.sony-europe.com	£600	Digital8	85x102x 206mm	880g	out	2.5in	1x1/6in	25x optical, 700x digital	N	N	Y	Long-range zoom, compatible	Heavy with Hi8, Night Shoot feature	8/10	6/10	5/10	8/10	8/10
ENTHUSIASTS																			
Hitachi DZ-MV100A	Hitachi: 08457 581 455 www.hitachi-consumer-eu.com	£1,500	8cm DVD-RAM disc	78x108x 166mm	830g	USB out for stills	3.5in	1x1/4in	12x optical, 48x digital	N	Y	Y	Analogue A/V input	Heavy, low on effects, expensive, not as good as DV	6/10	5/10	5/10	6/10	4/10
JVC GR-DVL557	JVC: 0870 330 5000 www.jvc-europe.com	£800	MiniDV	83x97x 188mm	610g	in/out	3.5in	1x1/4in	10x optical, 300x digital	Y	N	Y	Front-mounted lamp,	No accessory shoe massive LCD screen, DV input	8/10	8/10	7/10	7/10	6/10
Sharp VL-ME10H	Sharp: 0800 262 958 www.sharpelectronics.co.uk	£880	MiniDV	66x86x 175mm	540g	out	3in	1x1/4in	10x optical, 200x digital	Y	N	Y	Large LCD screen	No DV-in	8/10	8/10	6/10	6/10	6/10
Sony DCR-PC9E	Sony: 0990 111 999 www.sony-europe.com	£1,150	MiniDV	58x104x 97mm	490g	in/out	2.5in	1x1/4in	10x optical, 120x digital	Y	N	Y	Tiny, Carl Zeiss lens, touch-screen menu system	Fingers in front of lens, bottom loading	8/10	10/10	8/10	10/10	8/10
PROFESSIONALS																			
Canon MVX1i	Canon: 0800 616 417 www.canon.co.uk	£1,400	MiniDV	66x131x 129mm	660g	in/out	2.5in	1x1/4in	10x optical, 200x digital	Y	Y	Y (optical)	Compact, built-in flash	Heavy, awkward for small hands	6/10	8/10	9/10	7/10	7/10
Panasonic NV-MX300B	Panasonic: 0990 357 357 www.panasonic.co.uk	£1,750	MiniDV	75x113x 192mm	700g	in/out	2.5in	3x1/4in	12x optical, 200x digital	Y	Y	Y (optical)	Extremely good-quality picture, Leica Dicomar lens, feature-packed	Expensive, bottom-loading	8/10	7/10	10/10	10/10	9/10
Sony DCR-PC120E	Sony: 0990 111 999 www.sony-europe.com	£1,400	Mini DV	57x118x 113mm	580g	in/out	2.5in	1x1/4in	10x optical, 120x digital	Y	Y	Y	Compact, Carl Zeiss lens, S-Video in/out, Bluetooth	Fiddly operation, bottom-loading	6/10	9/10	9/10	10/10	9/10