

# Digital camcorders

## NEED TO KNOW

Digital camcorders are much smaller and have much better image quality than the old analogue ones. Editing is easier, too. With a good digital camcorder recording onto mini-DV tape, you can transfer your film to computer, edit it and then copy it to DVD, all while retaining good image quality. Editing is harder with camcorders that record onto mini-DVD discs, but they're convenient, as you can play the recorded disc in most DVD players.

Before buying any camcorder, try it out first to make sure you find it comfortable to hold.

### NEW RECORDING FORMATS

Hard-disk camcorders like the JVC (6) are very new. Without the need for tape or disk, they are usually smaller and lighter.

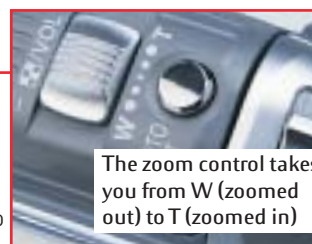
A few camcorders record on their built-in 'flash' memory. These are usually even smaller, and are sometimes referred to as mini-camcorders. With some models, such as the Samsung (21), you can insert a memory card to get more recording space.

### STILL PHOTOS

Most digital camcorders can take still photos but, despite the rise in megapixels, quality still falls short of what you can get with a decent digital camera. It's a useful feature to have, though, for a quick snap.

### OPTICAL ZOOM

This Panasonic has an optical zoom of x10, which means you can zoom in to make subjects up to ten times larger. Optical zoom can be useful when you can't or don't want to stand too close to your subject. Zooming too much while you're recording can make the viewer dizzy on playback, however, so try to keep it to a minimum – a good idea is to zoom before hitting 'record'.



The zoom control takes you from W (zoomed out) to T (zoomed in)

BEST ON TEST

1 Panasonic



### KEEPING THE CAMCORDER STEADY

Unless you want to go for the roving reporter look on your footage, the best way to avoid a shaky picture is to use a good tripod. Image stabilisation, a feature that all our camcorders have, removes minor effects of hand shakiness, although it's more effective on some models than others (see table, p46). With most camcorders there should be only a very small reduction in image quality. Unless you're using a tripod, always keep it on.

### BEST BUYS

Our three Best Buys, all Panasonics, take very good pictures with decent sound. They're easy to use and have long-lasting batteries. The non-Best Buys generally fall down on sound and aren't so good at taking pictures in dim light. For everyday use, the two cheaper Panasonics (1 and 3) have a good range of features and offer excellent all-round performance.

The **Panasonic (1)** has very good image stabilisation, takes good pictures in low light, and has excellent image quality overall. Sound recorded by the built-in microphone is OK, and its x10 zoom will be

powerful enough for nearly all shots. It has good battery life, with over two hours of continuous recording time (by contrast, the JVC (7) managed a meagre 45 minutes). It also has a quick and reliable autofocus system. It costs £650 from Jessops.

The **Panasonic (2)** is heavier, at 603g, and is quite long and wide for a camcorder, so you should try it out for comfort before buying. It's also the most expensive of our Best Buys (around £1,000 from Jessops, John Lewis and Miller



The image stabilisation function prevents shaky pictures

Brothers), as it has some more advanced features than the other two Best Buys. These include the ability to link it to your DVD player, video recorder or set-top box in order to record on to mini-DV tape. You can also take still pictures with a resolution of 3.1 megapixels – this is enough to help you create larger-sized prints without noticing blockiness.

The **Panasonic (3)** produces good overall images, although not quite so good as its higher-scoring siblings. Its image stabilisation is great, and it has the best battery life of all our camcorders – giving almost two and a half hours of recording time. Its features are more limited than the two other Best Buys: its digital still camera function has only 1.7 megapixels, with no flash, and it lacks a 16:9 option, which lets you view your recordings in true widescreen mode on a widescreen TV. However, it's still a great choice, and widely available for £450.

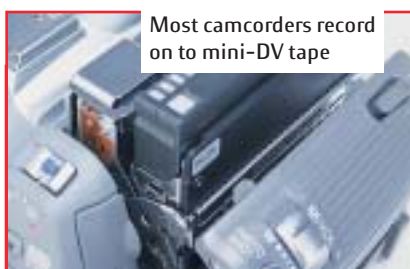
## OTHER CHOICES

The quality of images from the Canon (4) is only acceptable, but if excellent sound from the built-in mic and a more powerful zoom (x18) are important to you, this camcorder is worth considering. It's £500 from Jessops.

We also like the hard-disk JVC (6) for its lightweight cuteness, good image quality and decent all-round performance. Since our test,

## RECORDING IN POOR LIGHT

Camcorders generally struggle to produce good images in dim light. However, there are features to help you achieve a better picture. All our camcorders, including this Panasonic, have a 'night mode', resulting in not only a brighter picture, but also often in jerky movements in moving objects. Some camcorders also have video lamps that help to illuminate your subject, provided that it's within about a metre and a half.



Most camcorders record on to mini-DV tape

## RECORDING FORMATS

Most camcorders, including this Panasonic, record on to mini-DV tapes. These can be re-recorded on many times and offer more recording time than DVDs. Digital-8 tapes are a

bit bigger than mini-DV tapes. DVD camcorders record on to 8cm discs. DVD-R discs can be recorded on only once, but are compatible with most DVD players. DVD-RW and DVD+RW can be re-recorded on many times and can be edited in the camcorder itself, but this makes the disc incompatible with most DVD players. The hard disk JVC (6) records on a tiny removable hard drive called a microdrive.

JVC has launched models with 30GB internal hard disks, and we will review these next year. Should powerful software become available to allow easy editing of hard-disk footage, we think these camcorders could really take off.

## DON'T BUY

The Samsung (21) weighs just 158g and is the size of a cigarette packet. Unfortunately, both it and the cheaper Samsung (20) produce poor-quality images and sound.

## SCORE

Ignores price and is based on:

Image quality	35%
Sound quality	20%
Ease of use	20%
Features	10%
Autofocusing	5%
Battery life	5%
Still photos	5%

## KEY

★	☆	○	◐	●
Best				Worst
Best Buy				Don't Buy

## 20 more digital camcorders on test

The camcorders in the main table are best-selling models from the biggest brands, but we've tested 20 more models that are available in the shops. You can see the results for all of them at [www.which.co.uk/camcorders](http://www.which.co.uk/camcorders).

**More zoom** The three camcorders in the small table above have more than the standard x10 optical zoom, which is useful for filming from afar. For example, it can help make a footballer

Model	Price (£)	Optical zoom	Score (%)
Canon MVX45iE	£655	x14	60
Hitachi DZ-MV750E	£500	x16	56
Sony DCR-HC32E	£415	x20	55

on the other side of the pitch, or a bird on a faraway tree, appear much closer. Most camcorders allow you to control how quickly you zoom in and out. All camcorders also have digital zoom, but you should avoid using this, as it usually produces poor-quality images.



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## Digital camcorders

### MODEL

- 1 Panasonic NV-GS150EG-S
- 2 Panasonic NV-GS250EG-S
- 3 Panasonic NV-GS75EG-S
- 4 Canon MVX330i
- 5 Hitachi DZ-MV780E
- 6 JVC Everio GZ-MC200
- 7 JVC GR-X5
- 8 Sony DCR-DVD403E
- 9 Panasonic NV-GS35EB
- 10 Sony DCR-HC19E
- 11 Hitachi DZ-MV730E
- 12 JVC GR-DF470
- 13 Sony DCR-PC1000E
- 14 Panasonic NV-GS17EB
- 15 Sony DCR-PC53E
- 16 Sony DCR-TRV270E
- 17 Canon MV850i
- 18 Canon MV800
- 19 Sony DCR-DVD7E
- 20 Samsung VP-D352
- 21 Samsung VP-X110L



### SOUND QUALITY

All camcorders come with built-in microphones, but these usually aren't great. If, like this Panasonic, your camcorder has a mic-socket, you can improve the sound by attaching a good-quality external microphone. (Most Sony models are compatible only with Sony microphones.)



### USING THE TABLE

We tested best-selling models for £1,000 or under.

### Specification

**Price** For Best Buys we give the cheapest widely available high-street price as we went to press. Prices for other models are a guide to what you should expect to pay. **Format** See 'Recording formats', opposite. **Optical zoom** The higher the number, the more you can zoom in. **Video lamp** Improves image quality in low light.

### Performance

**Image stabilisation** This reduces the effect of hand shake. The higher the rating, the better it works. **Low light** Tested in 'night shot' mode. **Overall image** Tested under various light conditions. **Sound** The first rating is for sound with built-in microphone, the second with external microphone. n/a means you can't attach an external mic. **Ease of use** Includes recording, playback, LCD, portability, viewfinder and instructions.

## Video editing

With video editing on a computer, you can add, move, shorten and delete scenes and add special effects and soundtracks, turning your raw footage into a polished film. You can then save it to CD or DVD for watching on a computer or TV. Mini-DV is by far the best recording format for editing as, unlike DVD and hard-disk formats, it's compatible with most video-editing packages.

To transfer footage from a mini-DV camcorder to computer, use Firewire (Sony calls it i.LINK) to connect the camcorder and computer. All our mini-DV camcorders have a Firewire connection, but you'll need one on your computer, too, and a Firewire cable to connect them. You also



need a reasonably powerful computer – we recommend at least a 800MHz Pentium III processor, 256MB of Ram and plenty of free hard-disk space.

Microsoft Movie Maker 2.1 (free with Windows XP) and Ulead Video Studio (£35-£40) are two good editing packages – Ulead has more features, including the ability to burn your finished film to DVD.

If you just want to create a DVD with your raw mini-DV footage, connect your camcorder to a DVD recorder with a Firewire cable. The DVD recorder can record the footage directly from the camcorder tape.

Specification						Performance							Score
Price	Format	Weight (g)	Size wxhxd (cm)	Optical zoom	Video lamp	Image stabilisation	Low light	Overall image	Sound	Ease of use	Battery life	(%)	
650	mini-DV	509	8x7.5x13.5	x10		☆	☆	★	○/☆	☆	☆	71	
1,000	mini-DV	603	9x8x15.5	x10		☆	☆	★	○/★	☆	☆	71	
450	mini-DV	500	8.5x 8x13.5	x10		★	☆	☆	○/☆	☆	★	66	
500	mini-DV	578	8x8x14	x18	✓	○	⦿	○	☆/☆	☆	○	58	
530	DVD-Ram/DVD-R	483	9x6.5x13.5	x10		○	○	☆	○/☆	☆	⦿	57	
700	microdrive	362	7x5.5x10	x10		⦿	⦿	☆	○/n/a	○	○	57	
1,000	mini-DV	590	9.5x9x10.5	x10		⦿	⦿	☆	⦿/☆	○	●	57	
800	DVD-RW/DVD+RW/DVD-R	620	6.5x9.5x15	x10		☆	○	☆	⦿/○	☆	★	54	
350	mini-DV	480	8x8.5x13.5	x30	✓	○	○	○	○/☆	○	○	53	
300	mini-DV	470	6.5x9x12	x20		○	○	○	○/n/a	○	☆	53	
500	DVD-Ram/DVD-R	505	9.5x6.5x15	x16		○	○	☆	○/☆	○	○	52	
350	mini-DV	490	8.5x7.5x13	x15	✓	○	○	○	○/☆	○	⦿	51	
850	mini-DV	482	6x12x10.5	x10		⦿	○	○	●/☆	☆	○	51	
230	mini-DV	472	7.5x8.5x13.5	x 24		○	○	○	○/n/a	○	○	49	
500	mini-DV	380	4.5x8x10.5	x 10		☆	○	○	●/○	○	☆	48	
250	digital-8	911	8.5x9x16.5	x 20	✓	●	○	○	⦿/n/a	○	○	47	
380	mini-DV	503	6.5x9.5x14	x 22	✓	○	⦿	○	○/n/a	○	○	46	
250	mini-DV	500	6.5x9.5x14	x 20		○	⦿	○	○/n/a	○	○	43	
550	DVD-RW/DVD+RW/DVD-R	442	13x10.5x5	x 10		☆	○	○	●/n/a	○	☆	41	
200	mini-DV	481	7.5x9.5x12.5	x 20		○	○	⦿	⦿/○	○	○	39	
600	Memory Stick/built-in memory	158	3x9.5x6.5	x 10	✓	○	○	⦿	⦿/n/a	○	⦿	33	