

Moving images

Looking for a digital camcorder but don't know where to start? We've tried the latest models for you

Digital cameras and mobile phones are getting better at recording video. But if you're serious about home movies, a camcorder is a must. The range of models in the shops can be overwhelming, though, not least because there are so many recording formats to choose from (see 'For the record', p54). We've tested the latest models and cut through the jargon to help you pick the right one.

Camcorder technology is advancing, and high-definition (HD) models are now widely available. They usually allow you to capture more detail, achieve a greater sense of depth and reproduce colours more accurately than their standard-definition counterparts.

HD camcorders are usually more expensive than standard-definition models, but prices are coming down. We were astonished to find the Aiptek AHD200 (9) on sale for just £180. Disappointingly, it didn't perform well in our tests, and we found it lacks certain key features – even an optical zoom is missing.

If you're thinking of editing HD footage on a computer (see our video-editing software report on p56), bear in mind that this will place a greater strain on your PC – older computers in particular may struggle. And if you don't have an HDTV to watch your footage on, buying an HD camcorder may be an unnecessary expense.

If you opt for a standard-definition camcorder, what can

you look forward to? Many now have huge optical zooms. On some models you can find zooms as large as x42 – perfect if you want to film a footballer at the other end of the pitch, or even a lion in the Serengeti. Ideally, you should use a tripod or other support, though, to avoid shaky footage.

Some camcorders also feature zoom microphones – when you zoom in, the microphone picks up sound from further away.

Whichever camcorder you choose, your own filming ability will affect the quality of your results. Take a look at our video tips (see 'Shoot to thrill', p54) to see how you can get the most out of your equipment.

The Best Buys in this report are quite expensive, but we'll be testing some cheaper models in November.



How we test

Ready for a close-up?

Although ease of use, battery life and build quality are important, video quality is paramount.

To test how well a camcorder produces a good picture under difficult, but typical, conditions, we record a scene that contains lots of colour, detail, depth and movement. We also pan across the scene to test the reliability of the autofocus system. We perform the same tests in various conditions, including daylight and artificial and dim light.

To assess image quality, we use a projector to blow up each video to about 2.2 metres wide. At this size, even the smallest flaws are visible.

Transferring video to a computer

Save your movies to a PC in three simple steps

1 INSTALL SOFTWARE You can sometimes use third-party software, such as video-editing software, to transfer video to your computer. But your camcorder will come with its own disc. This will include an application that helps you transfer video. Place the disc into your computer, then follow the on-screen installation guide.

2 PLUG IT IN Use a USB or FireWire cable to connect your PC to the camcorder. Check that the camera is plugged into the mains and that the tape, disc or storage card is in place. Ensure that you are right at the start of the video clip you want to transfer by using the camcorder's playback controls. You can sometimes transfer video by inserting the

DVD into the computer's disc drive (check the manual to see if this is possible).

3 SWITCH IT ON When everything is connected, switch your camcorder on. A window will appear on your computer's screen offering you various options for copying the video over.





1 HIGH DEFINITION

71% Sony HDR-SR11E £600

Our cheapest HD Best Buy offers the best overall image quality, excelling outdoors in good light, and recording well in both artificial and dim light. It also has a very good viewfinder, useful when glare from the sun makes images on the LCD screen hard to see. Try this camcorder for feel and comfort before you buy, as it's one of the heaviest models on test. It's cheapest at Comet.

which? **BEST BUY**

WORTH KNOWING The Sony HDR-SR12E is similar but has a bigger hard disk and is more widely available.

Available Comet **Format** Hard disk **Weight** 640g **Optical zoom** x12 **Mic attachment** Yes



2 HIGH DEFINITION

68% Panasonic HDC-HS9 £730

The Panasonic HDC-HS9 comes with a large hard disk that can store seven hours of footage at the highest quality setting. Sound quality from the built-in mic is good and, unlike some Mini-DV or DVD models, it doesn't pick up annoying noise from the tape or DVD drive. Video image quality is excellent, although not quite up to the standard of the Sony (1). It's cheapest at Currys.

which? **BEST BUY**

WE LIKED Considering the number of features it has, this is a light and compact model.

Available Currys and John Lewis **Format** Hard disk **Weight** 440g **Optical zoom** x10 **Mic attachment** No



3 HIGH DEFINITION

68% Panasonic HDC-SD9 £650

This user-friendly model starts quickly and has a good LCD screen that is easier than most to view in bright sunshine. Battery life is good – it records for almost two hours on a single charge. Unfortunately, it stores only about 24 minutes of video on a 4GB memory card – so you'll need to stock up on extra cards if you're going on holiday. It's cheapest at Currys.

which? **BEST BUY**

WORTH KNOWING All our HD Best Buys use the AVCHD recording format, so if you buy video-editing software, make sure it's AVCHD compatible.

Available Currys and John Lewis **Format** Memory card **Weight** 330g **Optical zoom** x10 **Mic attachment** No



10 STANDARD DEFINITION

60% Panasonic SDR-H280 £455

Our best standard-definition camcorder scores less overall than our best HD model, but is cheaper and a good choice if you have a standard-definition TV. It lacks the excellent sharpness, detail and colour quality of our HD Best Buys, but it's good overall. It also has the best autofocus system of the standard models we tested – focusing is fast and reliable. It's cheapest online.

which? **BEST BUY**

WORTH KNOWING The H280 doesn't have a large angle of view with the lens zoomed out, so getting everyone in the shot in a small room could be difficult unless you use a lens converter.

Available Online **Format** Hard disk **Weight** 480g **Optical zoom** x10 **Mic attachment** No



11 STANDARD DEFINITION

58% Sony DCR-SR210E £600

The Sony DCR-SR210E captures good footage and sound, and is easier to use than the Panasonic (10). You can store video on the 60GB hard drive – which holds 14 hours and 40 minutes of high-quality footage – or a Memory Stick Duo card. Like the HD Sony Best Buy (1), it has face detection, which can improve the quality of your videos. It's cheapest at Currys.

which? **BEST BUY**

WE LIKED All Sony models on test have an infrared NightShot mode that allows you to record in darkness. NightShot video quality is poor, but it's a fun feature.

Available Currys **Format** Hard disk **Weight** 550g **Optical zoom** x15 **Mic attachment** Yes

Jargon buster

COMPOSITE This connection (also known as video or AV) allows you to link a camcorder to a TV. All camcorders have this basic socket and come with a connecting cable.

S-VIDEO This connection is similar to composite but offers slightly better video quality. It's available on some camcorders (usually through the same socket as composite), but the cable normally isn't included.

COMPONENT Offers a better picture than either composite or S-video, and can carry HD signals. The cable is sometimes included with your camcorder.

HIGH DEFINITION MULTIMEDIA INTERFACE (HDMI) If you have an HD

camcorder, you may find it has an HDMI output for connecting it to an HDTV. This connection offers the best quality, but it's only slightly better than component.

FIREWIRE Also known as IEEE1394 or i-link, this connection allows you to transfer Mini-DV footage (see 'For the record', p54) from camcorder to computer. If your computer doesn't have a FireWire socket, you can add one for about £25.

USB Every modern computer has a USB socket. On camcorders, the USB socket is used mainly to transfer footage from a DVD or hard-disk model to a computer.

For the record

Confused about video formats? Here's a quick guide

Mini-DV

Mini-DV is the standard camcorder recording format – although it's becoming less popular. Models are usually cheap to buy, as are Mini-DV tapes (a 60-minute tape costs around £3). Carrying around lots of tapes can be a hassle, as is fast-forwarding and rewinding.



DVD

DVD-based camcorders allow you to record straight to an 8cm disc, which you can play on a DVD player or computer. They usually have short recording times (around 20 minutes per disc at the highest recording quality in SD, and about 15 minutes in HD). Many camcorders accept Dual Layer (DL) discs that almost double these times.



Blu-ray

The **Hitachi (7)** is the only camcorder we tested that can record to 8cm Blu-ray discs. These are expensive – a basic, write-once disc (BD-R) costs about £15 and holds around an hour of footage recorded at the highest quality setting.

Hard disk drive (HDD)

Using a camcorder with a built-in hard disk drive means you can do away with tapes, discs and memory cards. Most hard disks can store more than seven hours of footage. Once you have used up the space, you must transfer the footage to a computer – tricky when you're away from home.

Memory card/internal flash memory

Most camcorders let you record to a memory card, and some have an internal flash memory (usually quite small). Memory card/internal flash memory devices are usually the lightest and most compact. A 4GB memory card costs around £20.

Contacts

Aiptek

www.aiptek.com

Canon 0870 514 3723

www.canon.co.uk

Hitachi 01628 643000

www.hitachi.co.uk

JVC

0870 330 5000

www.jvc.co.uk

Panasonic

0870 535 7357

www.panasonic.co.uk

Samsung 0845 726 7864

www.samsung.com

Sanyo 01923 246363

www.sanyo.co.uk

Sony 0870 511 1999

www.sony.co.uk

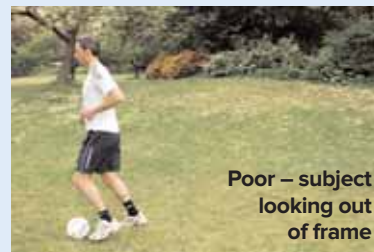
OUR RESEARCH

When selecting products to test, we consult manufacturers, market intelligence reports and industry experts, then check availability on the high street and online. Tested models include top sellers from the most popular brands, products with innovative features, models from some lesser-known brands and widely available Best Buys from previous tests.

Shoot to thrill

■ PLANNING

One reason professional video looks better than amateur footage is that the experts prepare before they press the record button. Try to plan a shot first, rather than simply hitting 'record' and hoping for the best.



Poor – subject looking out of frame

■ PANNING AND ZOOMING

Limit the use of pan (side-to-side filming of a moving object) and zoom, as too much of either can make a video difficult to view.

■ **FRAMING** Keeping your subject slightly off-centre and looking into the frame often creates a more interesting shot (see pictures below).



Better – although subject too central

MODEL	PRICE (£)	FORMAT	HARD DISK RECORDING TIME (mins)
HIGH DEFINITION			
1 SONY HDR-SR11E	600	HDD 60GB/memory card	430
2 PANASONIC HDC-HS9	730	HDD 60GB/memory card	460
3 PANASONIC HDC-SD9	650	Memory card	-
4 CANON HR10E	700	DVD (-RW, -R (DL))	-
5 PANASONIC HDC-SX5	500	DVD (RAM,-RW,-R (DL))/memory card	-
6 SANYO VPC-HD1000EX	600	Memory card	-
7 HITACHI DZ-BD70E	410	Blu-ray (-RE/-R), DVD (-RAM/-RW/+RW/-R)	-
8 SAMSUNG VP-HMX10C	430	Memory card/Internal flash memory (8GB)	-
9 AIPTK AHD200	180	Memory card/Internal flash memory (11.5MB)	-
STANDARD DEFINITION			
10 PANASONIC SDR-H280	455	HDD 30GB/memory card	420
11 SONY DCR-SR210E	600	HDD 60GB/memory card	880
12 SONY DCR-HC62E	350	Mini-DV	-
13 JVC GZ-MG365HE	210	HDD 40GB/memory card	860
14 SANYO VPC-CG65	400	Memory card/Internal flash memory (18MB)	-
15 SONY DCR-DVD110E	225	DVD (-RW,+RW,-R,+R (DL) /memory card	-
16 JVC GZ-MG330HE	165	HDD 30GB/memory card	430
17 PANASONIC VDR-D50	300	DVD (RAM,-RW,-R (DL))	-
18 PANASONIC NV-GS90	200	Mini-DV	-
19 SONY DCR-HC51E	140	Mini-DV	-

a This model records still photos on to the Mini-DV tape, not a memory card, so it's very difficult to then create image

ACCESSORIES You can enhance your video with some well-chosen accessories. An external microphone can make a huge difference to sound quality, while a wide-angle lens converter makes filming indoors easier. Extra batteries mean you can keep filming for longer, while a tripod is very useful if you're filming at a distance using zoom, as it helps keep the camera still, avoiding shaky footage.



Best – subject off-centre and looking into frame

USING THE TABLE

The more stars the better.

Specification

Price See p51. **Format** Recording formats that the camcorder accepts (see 'For the record', opposite). **Weight** Includes memory card, disc or Mini-DV, battery and hand strap. **Optical zoom** The higher the number, the closer you can zoom in. **Lens converter attachment** Whether you can fit a converter to increase the range of the zoom.

The size you need is shown in brackets. **Backlight compensation** Brightens the darkest areas of a picture – good for filming in front of a window. **Gain-up** Brightens all parts of a picture. **External mic attachment** Whether you can attach a separate microphone for better sound quality. **Surround-sound mic** To achieve a surround-sound effect, you may need to transfer video to a PC and burn a DVD using supplied software.

Test performance

Battery life Recording time in minutes on a single charge. **Image stabilisation** Reduces the effect of hand shake. **Autofocusing** Reliability and speed of autofocusing system, tested in various light conditions. **Overall video image quality** Tested in a variety of conditions, including daylight, dim light and artificial light. **Sound** Performance of each model's built-in mic. **Still photos** Image quality, shutter delay and start-

up time of still photo function. **Ease of use** Expert views on portability, recording, playback, LCD and viewfinder, and manual.

Score

Scores for HD and standard models are directly comparable. They ignore price and are based on:

Image quality	35%
Ease of use	20%
Sound quality	15%
Still photos	10%
Features	10%
Autofocusing	5%
Battery life	5%

SPECIFICATION										WHICH? TEST PERFORMANCE							SCORE %
WEIGHT (g)	SIZE (hwxwd) (cm)	OPTICAL ZOOM	LCD SIZE (INCHES)	LENS CONVERTER ATTACHMENT (mm)	BACKLIGHT COMPENSATION	GAIN-UP	EXTERNAL MIC ATTACHMENT	SURROUND-SOUND MIC	ZOOM MIC	BATTERY LIFE (mins)	IMAGE STABILISATION	AUTOFOCUSING	OVERALL VIDEO IMAGE QUALITY	SOUND	STILL PHOTOS	EASE OF USE	
640	7.5x9.5x14	12	3.2	✓(37)	✓		✓	✓	✓	99	★★★★★	★★★★	★★★★★	★★★★	★★★★	★★★★	71
440	7.5x8.5x12.5	10	2.7	✓(37)	✓			✓	✓	112	★★★★★	★★★★	★★★★★	★★★★	★★★★	★★★★	68
330	6.5x7.5x12.5	10	2.7	✓(37)	✓			✓	✓	119	★★★★★	★★★★	★★★★★	★★★★	★★★★	★★★★	68
600	9.5x8x13.5	10	2.7	✓(37)						101	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	66
660	9.5x8.5x17.5	10	2.7	✓(37)	✓		✓		✓	136	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	66
310	11.5x5x9.5	10	2.7	✓(41)		✓	✓			105	★★★★★	★★★★	★★★★	★★	★★★★	★★★★	56
660	9x8.5x16.5	10	2.7	✓(43)	✓		✓			102	★	★★	★★★	★★★★	★★★★	★★★★	50
360	7x7.5x12	10	2.6	✓(30)	✓		✓			94	★	★★★★	★★★	★★★★	★★	★★★★	50
190	12x4x8	n/a	2.4							94	★	★★	★★	★★	★★★★	★★★★	35
480	7.5x8.5x14	10	2.7	✓(37)	✓				✓	143	★★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	60
550	8x9x13.5	15	2.7	✓(30)	✓		✓	✓	✓	147	★★★★★	★★★★	★★★	★★★★	★★★★	★★★★	58
460	8.5x7x11.5	25	2.6	✓(30)	✓					110	★★	★★★★	★★	★★★★	★★	★★★★	44
360	7x6x12	35	2.6	✓(31)	✓	✓				120	★	★★	★★	★★★★	★★	★★★★	37
180	10.5x3.5x7.5	5	2.4							61	★★	★	★★	★★	★★★★★	★★★★	37
440	9x6.5x13	40	2.6	✓(30)	✓				✓	90	★★★	★★	★★	★★	★★	★★★★	37
360	7x6x12	35	2.6	✓(31)	✓	✓				115	★	★★	★★	★★★★	★★	★★★★	36
460	9.5x7x14	42	2.7		✓				✓	78	★	★★	★★	★★★★	★★	★★★★	35
450	8.5x7.5x12.5	42	2.7		✓				✓	100	★	★★	★	★★★★	see ^a	★★★★	33
440	8.5x7x11.5	40	2.4	✓(30)	✓					97	★	★★	★★	★★★★	see ^b	★★★★	33

files from them for printing b This model has no still photo function