

JVC[®]

The Perfect Experience / —

ProHD

Compact High Definition Camcorder
For Studio & ENG Applications
Live Uncompressed 720p & 1080i

GY-HD251

PRELIMINARY

ProHD - The perfect HD experience



720p/24, 25, 50

HDV[™] Mini **DV**
HDV 720p

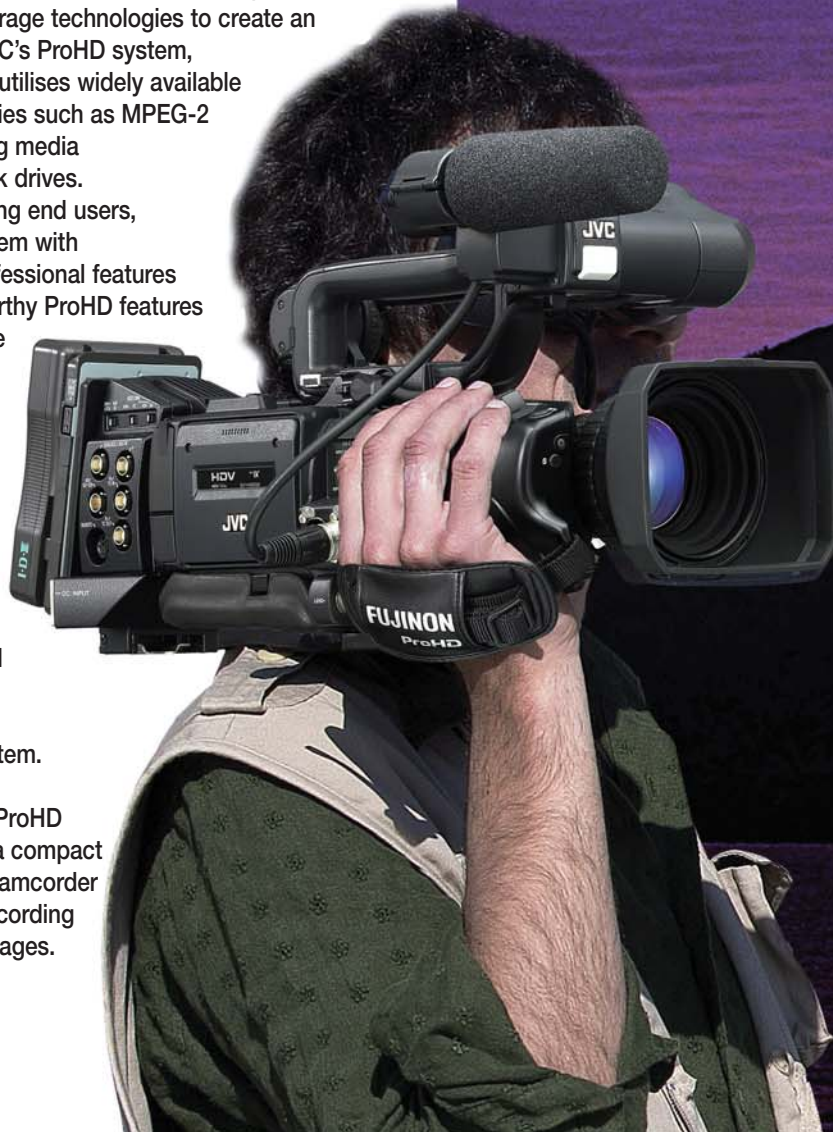
Defining the future of professional video with ProHD

With the introduction of JVC's ProHD, the promise of digital technology has finally been fulfilled. Surprisingly affordable, impressively professional, and remarkably compact, ProHD embraces the HDV format to deliver a complete high-definition solution that has been designed to meet the needs of today's most demanding professionals, while retaining the ability to adapt to future requirements.

Since the launch of D9 in 1996 and Professional DV in 1999, JVC has continued to develop and diversify its digital video offerings in response to the rapidly changing environment of visual communications and production. JVC continues to evolve its digital cameras and recorders with advanced features and varied storage options, including full-size DV tape and Hard Disk Drives.

Now with the production and delivery of video content starting to shift to high definition, JVC has combined its expertise in camera, encoding and storage technologies to create an affordable HD solution. JVC's ProHD system, adopting the HDV format, utilises widely available non-proprietary technologies such as MPEG-2 compression, DV recording media and conventional hard disk drives. Based on input from leading end users, JVC has developed a system with the most sought-after professional features and performance. Noteworthy ProHD features include full HD progressive scanning, real 24p, and a dual recording system using tape & HDD. As ProHD evolves, it will include optical and solid state recording media. Designed and built for professionals, ProHD is the fulfillment of the digital promise, offering true high definition performance in a compact, affordable system.

The latest addition to the ProHD system is the GY-HD251, a compact studio-capable shoulder camcorder featuring full-frame 50p recording for smooth, continuous images.



ProHD – JVC's Affordable HD Solution

1. HDV Full Progressive Scanning (720p)

Leading industry professionals told us that they wanted a full-frame progressive scanning system that would shoot and record the highest quality continuous moving images. ProHD uses the 720/50p progressive HDV format and produces crisp, native HD images which perfectly match today's digital displays and which can be converted easily, without degradation, to interlaced scanning pictures.

2. Time Code

As a professional system, ProHD products include the facility to record and display timecode. Convenient menu operation makes it easy to preset time code at the beginning of a tape. Simply select REC RUN or re-generation mode. User bits are also available.

3. Highly efficient video compression

To provide the highest quality HD recording, JVC uses the broadcast industry standard MPEG-2 Main Profile at H-14. Offering far greater efficiency than frame-bound systems, ProHD records at data rates at or above commercial broadcast rates. Recent advancements in non-linear editing have made it possible to edit ProHD on virtually all popular Non-Linear systems. Direct digital transfers via IEEE 1394 ensure the quality is maintained throughout the transfer process.

4. Dual recording system

Designed to utilise both DV tape and hard disk drives, ProHD offers the ultimate in media versatility, maximising productivity with efficient, economical editing and low-cost archiving. Now you can safely archive the original tape cassette and then plug the hard disk straight into your NLE. Editing can start right away — no need to make dubs or transfer data.

5. Real 24p

With ProHD, the dream of creating HD video with the essence of film has at last been realised. By capturing and recording at the film frame rate of 24fps, and offering extensive user configurable settings such as exposure, gamma and detail, ProHD becomes an important tool for creative expression. For the ultimate form of display on the cinema screen, 24 frame progressive recordings can be transferred easily to 16 mm or 35 mm film.



Advantages of ProHD

1. HDV format

HDV™ HDV 720p

HDV is a video format designed to enable the recording of high definition MPEG-2 video on standard DV media (DV or MiniDV cassette tape). The HDV

format was defined by four companies: Canon Inc., Sharp Corporation, Sony Corporation, and Victor Company of Japan, Limited (JVC). The specification of the HDV format incorporates two versions, one progressive (720p) and the other interlaced (1080i). HDV uses the same track pitch and tape speed as the DV format, and therefore the recording times are the same length as the DV format.

2. HD Progressive (720p/50) format for high quality moving pictures and digital stills

■ Progressive scanning

JVC's ProHD products use the same progressive scanning system used in high-end HDTV cameras. Because the GY-HD251 uses a full-frame (50p) progressive scanning system, it has the unique ability to capture and store full frames of image information. An added bonus of progressive scanning is that it is a very simple process to convert a progressive image to interlaced, but not vice versa. When progressive recordings are paused or played in slow motion, each individual frame contains the full detail of the original image — excellent for viewing and analysing motion. Stills and prints captured from HD progressive video look far better than from interlaced video. In any case, today's flat panel television displays and fixed matrix projectors, such as D-ILA, DLP and LCD, are all native progressive scanning systems. This means that JVC's progressive HDV recordings can be displayed without imperfection, because they do not need to pass through the degenerative process of de-interlacing, prior to being displayed.

■ HDV and DV compatibility

The HDV format uses the same recording track pitch (10 µm) as Professional DV, meaning that ProHD also offers track pitch compatibility with the DV format and the same recording time. This remarkable HD recording capability was achieved by developing a new high-power MPEG codec system capable of maintaining high-definition picture quality, whilst compressing the data to 19.7 Mbps bit rate. With its superior resolution and advanced processing, ProHD delivers top performance in both its native 16:9 HD mode and in the SD mode.

■ Progressive HDV-compatible support

To maximise picture quality and performance from input to output, JVC employs the HDV 720 progressive system. Progressive HDV's resolution of 1280 x 720 is the same as the native resolution of most HD display devices in use today (LCD, plasma, DLP, D-ILA). HDV 720p is thus natively compatible in terms of both resolution and scanning system with the vast majority of today's HD displays.

3. Real 24p

24p Progressive Full HD images are ideal for cinematographic applications. From shooting to editing and distribution, an HD system can be established for film-like productions. Unlike 24p images in standard definition, when real 24p HD video is down-converted to SD, the result is truly film-like DVDs. The camcorder itself, with its video lens removed and replaced by a film lens converter system, such as the Mini 35 from P & S Technik, effectively becomes a digital film camera.



The GY-HD251, fitted with Mini 35 film adapter from P & S Technik, becomes a digital film camera.

4. JVC's dual recording system

The optional JVC Hard Disk Recorder DR-HD100 creates a dual recording system of tape and hard disk. This system is already utilised by Professional DV users the world over. The many advantages inherent in JVC's dual recording system of tape & hard disk drive are well appreciated. It was only natural that JVC's range of ProHD models would include a Hard Disk Drive recorder and one that can operate equally in DV and HDV modes. The dual recording system provides fast and efficient HDD-based editing and cost-effective archiving, using low-cost tapes. Thanks to the newly developed MPEG-2 encoding IC, high-quality pictures can be recorded on readily available compact DV cassettes, so running costs are minimal. As no special equipment or exclusive media are required, the operating costs of the total system can be kept low. The DR-HD100 is mounted at the rear of the camcorder, utilising an optional bracket which is provided by the leading battery systems manufacturers.

GY-HD251 Compact ProHD camcorder for Studio and ENG applications

Professional ProHD camcorder with super-smooth 720p/50 imaging for ENG plus a 26-pin connector for studio use.

With 720p/50 capture and recording capabilities, the GY-HD251 delivers full-resolution HD images, ensuring the high resolution and smooth motion so critical to ENG and sports productions. Equally at home in the studio, the GY-HD251 is easily converted for studio use by means of the optional studio adapter KA-HD250, which incorporates an industry-standard 26-pin multi-core connection. Other valuable features of this versatile camcorder include genlock, component and HD SDI output, wide selection of optional HD lenses, enhanced cinema gamma, external time code synchronisation and sturdy professional connectors on a rugged die cast chassis.

From live field recording to high-end studio production, the GY-HD251 is the cost-effective answer to today's demand for high quality image-creation which is both flexible and affordable.



GY-HD251 fitted to the optional Studio Adapter KA-HD250 and with optional LCD Studio Viewfinder.



GY-HD251 **Compact ProHD camcorder for Studio and ENG applications**

Professional specifications

HDV and DV compatible

As the HDV format uses the same recording track pitch as Professional DV, the GY-HD251 can record signals in either standard (576i/50) or high definition (720p/50) according to the user's needs.

Real 24p camcorder

The GY-HD251 also offers real HD 24p recording capability — previously available on only the most expensive HD cameras. Ideal for DVD production, HD progressive 24-frame-per-second recording makes it possible to shoot images with film-like quality and smooth motion. Once recorded, those images can easily be transferred without frame rate conversion to 16 mm or 35 mm film with full HD fidelity.

ProHD's outstanding image quality is supported by a wide range of powerful pro-level features including an image inverse function that cancels image reversal (reversal of top/bottom and left/right) and a menu selection for the appropriate combination of colour matrix and

film gamma type. Cinelike gamma is deployed to make video look like film, and cinema gamma is used when the video will ultimately be transferred to film.

These choices of gamma mean that the cinematographer, irrespective of whether the final production will be presented as film or as video, can be sure of always getting the best possible film look.

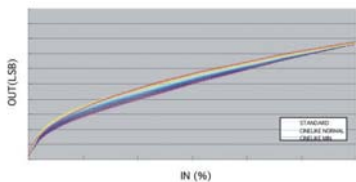
Interchangeable HD lenses

The GY-HD251 features a standard professional 1/3" bayonet lens mount, providing the opportunity to use a variety of other professional HD lenses. In addition to the standard Th16x Fujinon lens supplied, a number of other 1/3" bayonet mount zoom lenses is available. Canon offers a powerful 20x5mm zoom lens and Fujinon similarly an 18x4.2mm, besides a very wide 13x3.5mm lens and two versions of 17x5mm, one ENG and the other studio type.

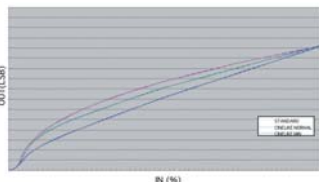
Furthermore, lens mount adapters ACM-12 and ACM-17 convert the mount, respectively, to 1/2" and 2/3" bayonet mount, allowing cost saving by being able to use existing 1/2" and 2/3" lenses.

Also, if you wish to use existing specialist film lens adapters are available.

Cinelike Gamma
(for film-like video productions)



Cinema Gamma
(for subsequent transfer to film)



Fujinon HTs18x4.2BRM



Canon KT20x5BKRS



3-CCD camera system with 720p HD CCDs

The GY-HD251 uses three 1/3" high definition CCD image sensors. Each array has a pixel resolution of 1280 x 720 and uses a micro lens system. Since this native resolution matches that of most HDTV displays, the need for image scaling is eliminated, further enhancing the quality of the recorded images. Another advantage of using these CCDs is their sophisticated circuitry which virtually eliminates both lag and image burn.

Uncompressed 720p/50 live output via HD SDI and component

For certain broadcast applications, the GY-HD251 can output a live uncompressed 720p/50 signal in the form of either analogue component or HD SDI, which also carries embedded audio and is therefore ideal as a feed to a video server, HD switcher or microwave link.

Uncompressed 1080i/50 live output via HD SDI and component

One very important reason why JVC developed the progressive form of HDV was the ease and speed of converting a progressive signal to other formats, irrespective of whether up- cross- or down-converting. The conversion is always real time, because the time-consuming complexity of de-interlacing is not required. The conversion of 720p to 1080i is relatively simple, and therefore fast, hence the live uncompressed 1080i output via the HD SDI port. Similarly, the GY-HD251 can be set to output 1080i/50 from recorded 720p/50 footage, whether on MiniDV cassette or on DR-HD100's hard disk drive. The HD SDI signal also carries embedded audio.

Professional functions

Compact shoulder mount

JVC's ProHD camcorders are the first fully professional HD camcorders to feature a compact design and shoulder mount. Like its predecessors, the GY-HD251 offers excellent mobility and enhanced usability, while its flexible range of ergonomic adjustments ensures that any camera operator, regardless of stature or physique, can support the camcorder firmly and, above all, comfortably.

Professional functions and switch layout

In addition to the Full Auto Shooting to handle difficult or variable lighting environments, the GY-HD251 is equipped with an array of functions that give professionals creative flexibility. These include, zebra, gain, white balance and full shutter control. Also, the GY-HD251's switches have been positioned where professional camera operators expect them to be. Shooting is intuitive, precise, easy, and error-free, because there is no learning process to go through. The GY-HD251 is the ideal camera for any assignment.

Detachable 230,000-pixel LCD colour viewfinder

The viewfinder's eyepiece can be moved backwards and forwards and can also be adjusted laterally for left or right eye shooting, so the viewfinder can fit any operator comfortably. JVC's own developed Focus Assist control ensures fast and easy



GY-HD251

Compact ProHD camcorder for Studio and ENG applications

focusing. It has 3 settings, (high, medium & low) depending on the type of subject in view. To make focusing even easier, a black and white mode is available. Stronger contrast and reduced colour noise make visualisation and composition easier in this mode and put less strain on the eyes so you can shoot for longer periods. You can also keep using the eyepiece viewfinder even when using the LCD display. If not required, the eyepiece viewfinder may be detached.

3.5" LCD display panel

This 250,000-pixel 3.5" colour TFT LCD monitor provides a high-resolution image during shooting and playback. JVC's own developed Focus Assist control (see this page) ensures fast and easy focusing. A push button selects three display modes:

1. Video only
2. Video images with text information overlay including time, status, mode and other data are shown on the screen.
3. Only information such as time, status, mode, time code, audio levels and other data is shown on the screen.



Various audio-related functions

When colour bars are output, an audio reference level (test tone) can also be output if required. This is requested via the menu. The audio reference level can be set at -12 dB or -20 dB as required. To minimise extraneous noise picked up by the microphone, a "wind cut" function is provided.

Various control functions

This camcorder has a genlock input capability for synchronisation and time code input/output, making multi-camera shooting possible.

Versatility and flexibility

Camera settings recorded on SD card

Customised settings can be stored on a standard SD memory card and loaded into another GY-HD251 or changed on site, as required.

IEEE 1394 (FireWire) in/out and HD SDI out

A convenient IEEE 1394 interface allows easy direct connection to NLE systems or to a PC for capturing, editing and archiving.

An HD SDI connector (BNC) is provided on the rear panel for the output of uncompressed 720p and cross-converted 1080i. The HD SDI signal also carries embedded audio.

User-friendly design

Universal ergonomic design

The camcorder adapts to fit any shape of body comfortably because of the shoulder pad that can be moved back and forth, the left-eye right-eye viewfinder with eyepiece that can also adjust back and forth, and the padded audio monitor that slides up & down.



Patented "FOCUS ASSIST" function

A JVC patented device, Focus Assist, turns focusing into a fast, easy and accurate process. When Focus Assist is activated, the picture in the viewfinder becomes monochrome and all objects which are in focus take on a coloured fringe. In addition to the factory default Middle position, Low and High positions are available. In the Low position, you can limit the area in focus for more precise focusing. This is particularly helpful when using the technique of pulling focus. Focus Assist works equally in the 0.44" viewfinder and the 3.5" LCD panel. There are two Focus Assist buttons, one for each of handheld and shoulder operation.



Out-of-focus image



In-focus image

The edge of the in-focus subject is shown in colour, telling the operator that the subject is in-focus. A major benefit of this system is that it operates in real time.

Connect to optional external HDD

The camcorder has a hard disk drive accessory option, DR-HD100, which connects via the IEEE 1394 port, allowing footage to be edited immediately without having to wait for data to be transferred.

Other features

- Two XLR audio inputs
- Full Auto Shooting
- Adjustable colour matrix
- LCD mirror mode
- Two-mode composite out
- Colour bars

DR-HD100 Hard Disk Drive incorporating the latest DTE (Direct to Edit™) technology

Connects to GY-HD251 camcorder

The DR-HD100 has been designed specifically to attach to the GY-HD251 camcorder. Interlocked to the camcorder's record trigger, HD and SD images can be recorded together with audio and time code. It is powered by either a built-in rechargeable or an external battery. The DR-HD100 is supplied with its own cradle, from which it is detached easily. Optional bracketry is available for mounting the HDD recorder at the rear of the camcorder.

Compatible with popular NLE systems for HDV and DV editing

DTE™ technology permits the DR-HD100 recording data in HDV and DV to be set to the NLE's native file format. This means that no time is lost to the lengthy processes of file transfer and rendering. Use DR-HD100 instantly with the most popular applications from Adobe, Apple, Avid, Canopus and many more. As new application support is released, the DR-HD100 can be updated in the field with new system software, by an easy process using the disk drive itself.

Integrated with camcorder and disk drive operation

Attached with the GY-HD251, the DR-HD100's record and record/pause

functions are controlled from the camcorder. Time code generated by the camcorder is recorded to files on the DR-HD100 and DR-HD100 status and other information appears in the viewfinder and LCD display.

Long record times

This hard disk drive option extends uninterrupted record time by hours. For example, an 80GB FireWire drive can store 6 hours of DV video and 7.5 hours of HDV video, and a 40GB drive does half these times. It is possible also to daisy chain up to four external drives of different capacities to the DR-HD100, enabling uninterrupted recording of incredibly long durations.

LCD display and playback modes

The DR-HD100 features a detailed LCD that displays system mode, time code and disk space remaining. When used with the GY-HD251 camcorder, clips can be reviewed on the viewfinder, LCD panel or external monitor, by using DR-HD100's playback mode. Functions include record, play, pause, stop, forward index, back index and multi speed fast forward and rewind.

Specifications

GY-HD251E

[General]

Power requirement: DC 12 V (10.5 — 17 V)
 Power consumption: Approx. 20 W (in Record mode)
 Dimensions: 242 (W) x 233 (H) x 414 (D) mm
 Mass: 3.7 kg (including viewfinder, microphone and tape)
 Temperature:
 ■ Operating: 0°C to 40°C
 ■ Storage: -20°C to 60°C
 Humidity:
 ■ Operating: 30% to 80% RH
 ■ Storage: 85% RH or less

[Camera section]

Image pickup device: 1/3" interline-transfer CCDs
 Colour separation optical system: F1.4, 3-colour separation prism
 Number of pixels: Total: Approx. 1,110,000 pixels
 Colour system: PAL (wide band R-Y, B-Y encoder)
 Colour bars: SMPTE HDTV colour bars/EBU colour bars
 Sync system: Internal sync (built-in SSG)
 External sync: BB, VBS, signal or HD tri-sync signal
 Sensitivity: F8, 2000 lx (typical)
 Minimum illumination: 6 lx with F1.4, at 18 dB
 Lens mount: 1/3" bayonet system
 ND filter: +1/4ND, +1/16ND
 Gain: 0, 3, 6, 9, 12, 15, 18 dB, ALC
 Electronic shutter:
 ■ Standard value: 50 Hz
 ■ Fixed values: 7.5-10,000 Hz, 11 steps (HDV HD60P/HDV HD30p) 6.25-10,000 Hz 11 steps (HDV HD50p/HDV HD25p; DV 50i/DV25p mode), 6-10,000Hz, 12 steps (HDV HD24p/DV 24p)
 ■ Variable scan: about 60 to 10,000Hz (HDV HD60p/HDV HD30p)/ about 50 to 10,000 Hz (HDV HD50p/HDV HD25p; DV 50i/25p mode), about 24-10,000Hz (HDV 24p; DV24p)

[VTR section]

[Video]
 Recording format: 720/24p, 720/25p, 720/30p, 720/50p, 720/60p, 576/25p, 576/50i
 Video Format:
 [HDV]
 ■ Video signal recording format: HDV1 format, 8-bit, 19.7 Mbps
 ■ Compression: MPEG-2 video (profile & level: MP@H-14)
 ■ Sampling frequencies: 720/60p: 74.25/1.001 MHz (4:2:0 component), 720/50p: 74.25 MHz (4:2:0 component), 1080/60i: 74.25/1.001 MHz (4:2:0 component, cross conversion only), 1080/50i: 74.25 MHz (4:2:0 component, cross conversion only)
 [DV]
 ■ Video signal recording format: DV format, 8-bit, 25 Mbps
 ■ Compression: DV compression, 4:2:0

Audio:

[HDV]
 ■ Audio signal recording format: MPEG1 Audio Layer II
 [DV]
 ■ Audio signal recording format: 16-bit (locked audio), 48 kHz PCM for 2 channels or 12-bit, 32 kHz PCM for 4 channels
 ■ Usable tape: Mini DV tape
 ■ Tape speed: 18.831 mm/sec.
 ■ Record/play time: 63 minutes (with an M-DV63PROHD tape)

[Connectors]

HD/SD SDI output: 0.8 V (p-p), 75 ohms, unbalanced (BNC)

HD SDI: SMPTE292M/299M standard (embedded audio)
 SD SDI: SMPTE259M/272M standard (embedded audio)
 Analogue composite output: 1.0 V (p-p), 75 ohms, unbalanced (RCA)
 Analogue component output:
 ■ Y: 1.0 V (p-p), 75 ohms, unbalanced (BNC)
 ■ R-Y/B-Y: 0.7 V (p-p), 75 ohms, unbalanced (BNC)
 ■ Analogue composite input: 1.0 V (p-p), 75 ohms, unbalanced (BNC: switchable from Genlock input)
 ■ Genlock input: 1.0 V (p-p), 75 ohms, unbalanced (BNC)
 Audio inputs:
 ■ Mic: -60 dBs, 3 kohms, balanced (XLR), +48 V output for phantom power supply
 ■ Line: +4 dBs, 10 kohms, balanced (XLR)
 ■ Audio outputs: -8 dBs, low impedance, unbalanced (RCA)
 ■ Earphone jack: -18 dBs to -60 dBs, 8-ohm impedance (stereo mini-jack x2)
 ■ Time code input: 0±6 dBs, high impedance, unbalanced (BNC: switchable from component output)
 ■ Time code output: 0±6 dBs, low impedance, unbalanced (BNC: switchable from component output)
 ■ IEEE1394 connector: 6-pin
 ■ Remote connector: DIN 6-pin

[Accessories provided]

Viewfinder x 1, Lens (Th16x5.5BRM) x 1, Microphone x 1, SD memory card x 1

RECORDING FORMATS & LIVE SIGNAL OUTPUTS

	Recording (Shooting)	Rec on tape	1394 out	Component/SDI out (EE out)	Composite out
HD (HDV)	720/60p	←	←	←	480/60i
	720/30p	←	←	720/60p	480/60i
	720/50p	←	←	←	576/50i
	720/25p	←	←	720/50p	576/50i
	720/24p	←	←	720/60p	480/60i
HD	720/60p	N/A	N/A	1080/60i	480/60i
	720/50p	N/A	N/A	1080/50i	576/50i
DV	576/50i	←	←	←	←
	576/50i (25p)	←	←	←	←

	Playback	1394 out	Component/SDI out			Composite out
HDV	720/60p	←	480/60i	1080/60i	720/60p	480/60i
	720/30p	←	↑	↑	↑	↑
	720/50p	←	576/50i	1080/50i	720/50p	576/50i
	720/25p	←	↑	↑	↑	↑
	720/24p	←	480/60i	1080/60i	720/60p	480/60i
DV	576/50i	←	←	←	←	←
	576/50i (25p)	←	←	←	←	←

	Recording (1394 in)	Rec on tape	1394 out	Component/SDI out			Composite out
HDV	720/60p	←	←	480/60i	1080/60i	720/60p	480/60i
	720/30p	←	←	↑	↑	↑	↑
	720/50p	←	←	576/50i	1080/50i	720/50p	576/50i
	720/25p	←	←	↑	↑	↑	↑
	720/24p	←	←	480/60i	1080/60i	720/60p	480/60i
DV	576/50i	←	←	←	←	←	←
	576/50i (25p)	←	←	←	←	←	←

* Recordings in HDV 1080i format cannot be played back by GY-HD251 and BR-HD50.

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 * DVCAM™ is a registered trademark of Sony Corporation.
 * DTE™ (Direct to Edit™) is a registered trademark of Focus Enhancements.
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• Tapes recorded in HDV1080i format cannot be played back by GY-HD251 and BR-HD50.
 ■ Hachioji Business Center of Victor Company of Japan, Ltd. has received ISO14001 and ISO9001 Certifications under the global standard for environmental management.

Simulated pictures.
 The values for weight and dimensions are approximate.
 E. & O.E. Design and specifications subject to change without notice.