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Ihr autorisierter JVC Professional Partner bei den Bavariafilmstudios magic multi media GmbH • Bavariafilmplatz 3 • D-82031 Grünwald Telefon: +49 (0) 89 20 35 87 - 30 • Telefax: +49 (0) 89 20 35 87 - 37 gebührenfreie Hotline: 0800 3884336 • e-mail: info@digitalschnitt.de



Compact High Definition Camcorders

GY-HD200 GY-HD201

For ENG, EFP and cinematography

ProHD — The complete HD solution



720p/24, 25, 50

HDV 720p

ProHD - defining the future of professional video

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 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, the GY-HD200/GY-HD201 is a compact shoulder-mount camcorder featuring full-frame 50p recording for smooth, continuous images.





The advantages of ProHD

1. HDV format



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-HD200/201 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, all utilise a native progressive scanning system. 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 μ m) 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, either 16:9 or 4:3.

■ 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.

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 tape 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.



Optimised picture quality from innovative JVC technology within GY-HD200/201/251

Horizontal resolution and signal-to-noise ratio have been enhanced, making the already high ProHD picture quality even better. Together with ProHD's superior colour reproduction, these improvements ensure true professional quality HD imaging. These are JVC's key technology innovations.

a. 14-bit A/D converter

To improve both the S/N ratio and the horizontal resolution, a new 14-bit A/D converter was specially developed by JVC to prevent signal deterioration and to generate a fourfold increase in gradations.

b. Wideband front end processing

The ProHD camcorder uses a wideband analogue front end to process its CCD sampling via the 14-bit A/D converter. This further improves the S/N ratio and horizontal resolution by optimising the CCD drive circuitry. The new LVDS (Low Voltage Differential Signal) interface minimises any other possible signal degradation and so contributes to the improved S/N ratio.

c. Newly-developed pixel converter

To enable 720p/50 recording, a new super encoder and a new pixel converter were developed, incorporating an adaptive filter which optimises the scalar performance of cross-converted signals, including 1080i. The resultant effects are increased resolution and reduced aliasing. Objects thus have much more natural looking edges and images are therefore extremely lifelike in appearance.

Professional ProHD camcorder with smooth 720p/50 capture for best quality images in ENG, EFP and cinematography

Designed for news gathering, field production and cinematography, the GY-HD200/201 offers full-frame 720p/50 imaging and real 24p recording capability. Its high resolution and smooth motion make it perfect for ENG and recording sports events, while its HD progressive 24 frames per second record rate lends itself to cinematic productions, giving them a very natural and film-like appearance. So whatever your HD requirements may be, this ProHD camcorder from JVC provides an affordable HD solution which can



Interchangeable HD lenses

The GY-HD200/201 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 17x5mm lens.

Furthermore, lens mount adapters ACM-12 and ACM-17 convert the mount to 1/2" and 2/3" bayonet mount respectively, providing cost savings by way of using existing 1/2" and 2/3" lenses. Also, to enable the use of film camera lenses, specialist film lens adapters are available.





Fujinon HTs18x4.2BRM

Canon KT20x5BKRS

Professional specifications

HDV and **DV** compatible

As the HDV format uses the same recording track pitch as Professional DV, the GY-HD200/201 can record signals in either standard (576i/50) or high (720p/50) definition, according to the user's needs.

Real 24p camcorder

The GY-HD200/201 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 features which have great appeal to true film professionals. These include the image inverse function, as required by certain film lens adapters, and a menu to select the appropriate combination of colour matrix and film gamma type. Cinema Gamma is deployed to make video look like film, and Film Out gamma is used when the video is to be ultimately transferred to film.

This choice of gamma means 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.

Cinema Gamma Film Out Gamma

STATE STANLARD CONSTANT AND CON

(for film-like video productions)

(for subsequent transfer to film)

3-CCD camera system with 720p HD CCDs

The GY-HD200/201 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 component

When required, the GY-HD200/201 can output a live uncompressed 720p/50 signal in the form of analogue component signal, making it an excellent choice as a video server feed.

Uncompressed 1080i/50 output via component

One very important reason why JVC developed the progressive form of HDV was the ease and speed with which a progressive signal can be converted to other formats, irrespective of whether the conversion is up, cross or down. Conversion is always performed in real time because the time-consuming complexity of de-interlacing is not required. The GY-HD200/201 can be set to output 1080i/50 from any recorded 720p/50 footage, whether recorded on a MiniDV cassette or on the DR-HD100 hard disk drive.

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-HD200/201 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.

GY-HD200

GY-HD200 ProHD Compact Shoulder Camcorder (HDV/DV output only) GY-HD201 ProHD Compact Shoulder Camcorder (HDV/DV input/output)

Professional functions and switch layout

In addition to the Full Auto Shooting to handle difficult or variable lighting environments, the GY-HD200/201 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-HD200/201'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-HD200/201 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 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, which allows longer periods of shooting. The eyepiece viewfinder can be used at same time as the LCD display. If it is 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 highresolution image during shooting and playback. JVC's own developed Focus Assist control 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

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-HD200/201 or changed on site, as required.

IEEE 1394 (FireWire) in/out

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

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 & forth, the left or right eye viewfinder that can also adjust back & 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. Footage captured on the hard disk can be edited immediately without having to wait for data to be transferred.

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

Connects to GY-HD201 camcorder

The DR-HD100 has been designed specifically to attach to the GY-HD201 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 to the GY-HD201, 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. The status of the DR-HD100 and other vital information appears in the camcorder's 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-HD201 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.

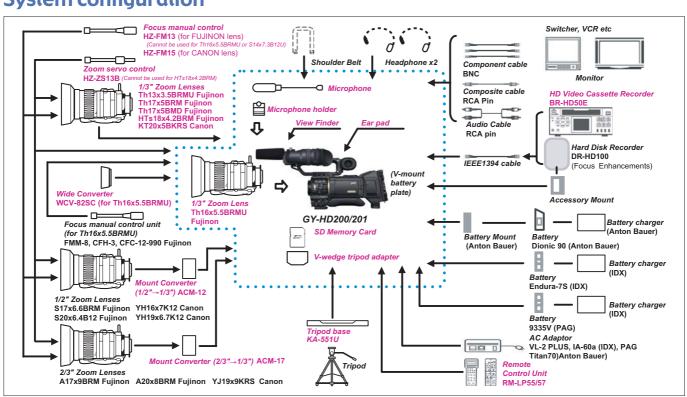
Other features

- Two XLR audio inputs
- Full Auto Shooting
- Adjustable colour matrix
- LCD mirror mode. ■ Two-mode composite out
- The "heel" with the KA-V100 being the "toe" for tripod based attachment

Optional accessories & related equipment



System configuration



SPECIFICATIONS

GY-HD200/201

[General]

Power requirement: DC 12 V (10.5 — 17 V) Power consumption: Approx. 23 W (in Record mode) Dimensions: 224 (W) x 242.3 (H) x 414 (D) mm

Mass: 3.8 kg (including lens [Th16x5.5BRMU], 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

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

■ 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)

[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]

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)

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)

■ 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 V-wedge tripod adapter (KA-V100) x 1

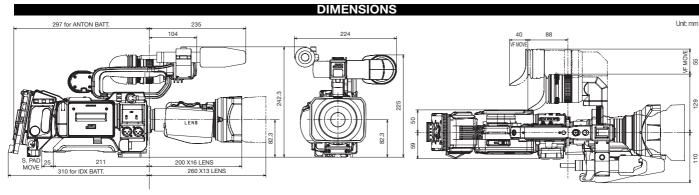
RECORDING FORMATS & LIVE SIGNAL OUTPUTS

	Recording (Shooting)	Rec on tape	1394 out	Component (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			Composite out
HDV	720/60p		7	-	480/60i	1080/60i	720/60p	480/60i
	720/30p		7	←	1	1	1	1
	720/50p	/		←	576/50i	1080/50i	720/50p	576/50i
	720/25p	/		←	1	1	1	1
	720/24p			-	480/60i	1080/60i	720/60p	480/60i
DV	576/50i			←		~		←
	576/50i (25p)	/		←		←		←

	Recording (1394 in)	Rec on tape		Component			Composite out
HDV	720/60p	-		480/60i	1080/60i	720/60p	480/60i
	720/30p	-		1	1	1	1
	720/50p	←		576/50i	1080/50i	720/50p	576/50i
	720/25p	←		1	1	1	1
	720/24p	←		480/60i	1080/60i	720/60p	480/60i
DV	576/50i	-	/		←		←
DV	576/50i (25p)	«	/		←		+

^{*} Tapes recorded in HDV 1080i format cannot be played back by GY-HD200, 201 or 251 nor by BR-HD50.



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**DTE™ Direct of Edf™) is a registered trademark of Focus Enhancements.
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Simulated pictures.

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■ Hachioji Business Center of Victor Company of Japan, Ltd. has received ISO14001 and ISO9001 Certifications under the global standard for environmental management