

# JVC<sup>®</sup>

The Perfect Experience / —

# ProHD

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

# GY-HD251

ProHD - The perfect HD experience



# 720p/24, 25, 50

**HDV<sup>™</sup>** 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. The evolution of JVC's range of digital cameras and recorders continues with the introduction of 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 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 to 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.



GY-HD251

# 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 an optional 26-pin adapter 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.*

### **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.*

#### **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.

#### **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.

#### **Enhanced linearity**

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.

# 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 definition (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. Cinema gamma is deployed to make video look like film, and Film Out 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.

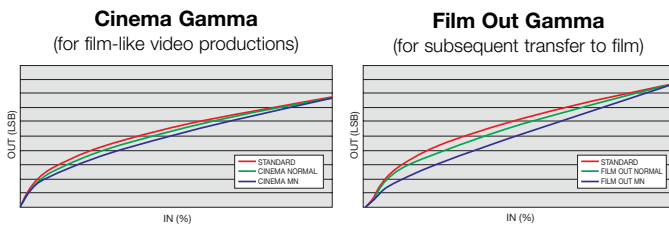
Also, to enable the use of film camera lenses, specialist film lens adapters are available.

#### 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 or 1080i/50 signal in the form of either



Fujinon HTs18x4.2BRM



Canon KT20x5BKRS



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 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.



# GY-HD251

## Compact ProHD camcorder for Studio and ENG applications

### 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
- Front and rear mounting fixtures for tripod plate

## 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.



### BR-HD50 ProHD Recorder/Player

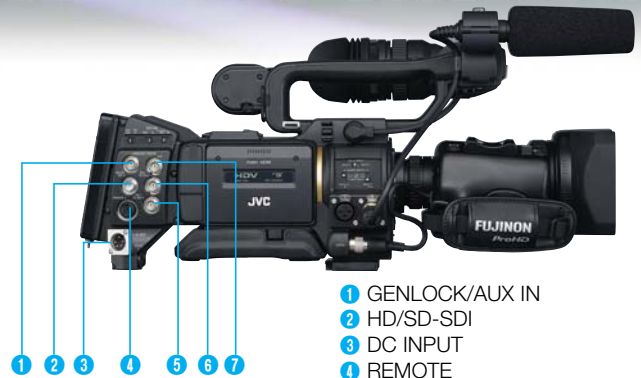
- HDV recording
- Multi-format output and cross-converter function
- HDV 60Hz and 50Hz compatibility
- Standard DV & Mini DV compatible mechanism
- DVCAM playback capability
- Auto error correction system
- Sweeper heads
- HDMI OUT
- RS-422A interface
- IEEE 1394 interface
- Versatile analogue connectors

### Studio Adapter



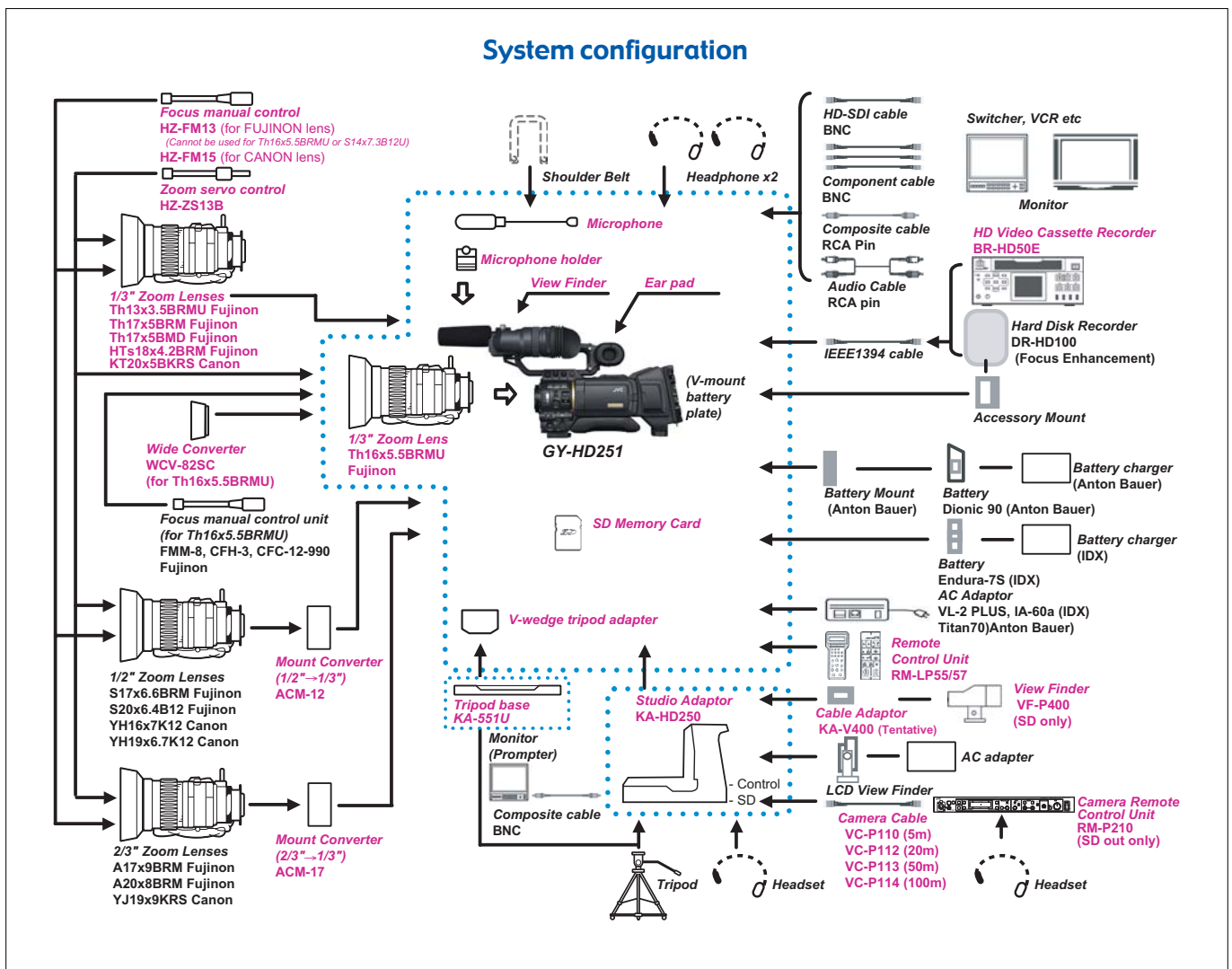
GY-HD251 fitted to the optional Studio Adapter KA-HD250 and with optional LCD Studio Viewfinder.

### Rear panel connectors



- 1 GENLOCK/AUX IN
- 2 HD/SD-SDI
- 3 DC INPUT
- 4 REMOTE
- 5 P<sub>R</sub>/TC OUT
- 6 P<sub>B</sub>/TC IN
- 7 Y

### System configuration



# Optional accessories & related equipment

## CAMCORDER OPTIONS

<p><b>1/3" High quality zoom lens</b></p>  <p>(Fujinon)</p> <p>■ <b>HTs18x4.2BRM</b></p>	<p><b>1/3" Wide zoom lens</b></p>  <p>(Fujinon)</p> <p>■ <b>Th13x3.5BRMU</b></p>	<p><b>1/3" Zoom lens</b></p>  <p>(Fujinon)</p> <p>■ <b>Th17x5BRM</b></p>	<p><b>1/3" MD Zoom lens</b></p>  <p>(Fujinon)</p> <p>■ <b>Th17x5BMD</b></p>	<p><b>1/3" High quality zoom lens</b></p>  <p>(Canon)</p> <p>■ <b>KT20x5BKRS</b></p>
<p><b>Lens mount converter</b></p>  <p>(Fujinon)</p> <p>■ <b>ACM-17</b> (2/3" → 1/3") ■ <b>ACM-12</b> (1/2" → 1/3")</p>	<p><b>Wide converter</b></p>  <p>(Fujinon)</p> <p>■ <b>WCV-82SC</b> for use with the Th16x5BRMU</p>	<p><b>Tripod base</b></p>  <p>■ <b>KA-551U</b></p>	<p><b>7" LCD monitor</b></p>  <p>(Marshall)</p> <p>■ <b>V-R70P-HDA</b></p>	<p><b>6" LCD monitor</b></p>  <p>(Astro)</p> <p>■ <b>DM-3106</b></p>
<p><b>IDX V-mount battery</b></p>  <p>■ <b>VL-2PLUS</b> (Charger) ■ <b>Endura E-7S</b> (Battery)</p>	<p><b>PAG V-mount battery</b></p>  <p>■ <b>9335V</b> (Battery) ■ <b>9613V</b> (Charger)</p>	<p><b>Anton Bauer battery</b></p>  <p>■ <b>Dionic 90</b> (Battery) ■ <b>Titan70</b> (Adapter)</p>	<p><b>Microphone</b></p>  <p>■ <b>MV-P615U</b></p>	<p><b>ProHD recorder</b></p>  <p>■ <b>BR-HD50E</b></p>
<p><b>Studio adapter</b> (for GY-HD251)</p>  <p>■ <b>KA-HD250U</b> 26-pin out</p>	<p><b>Camera control unit</b> 26-pin multicore</p>  <p>■ <b>RM-P210E</b> 26-pin in</p>	<p><b>Remote control units</b> 6-pin DIN</p>  <p>■ <b>RM-LP55U</b> (Handheld) ■ <b>RM-LP57U</b> (Desk mount)</p>	<p><b>Manual zoom control</b></p>  <p>■ <b>HZ-ZS13BU</b> ■ <b>HZ-ZS100U</b> (Handle zoom) <small>Cannot be used for HTs18x4.2BRM lens. Use Fujinon ZMM-6; Module unit/CZH-14; Grip/CFC-12-990; Cable/MCA-7; Mounting clamp</small></p>	<p><b>Manual focus control</b></p>  <p>■ <b>HZ-FM13U*</b> (Fujinon) ■ <b>HZ-FM15U</b> (Canon) <small>*The HZ-FM13 cannot be used for S14 and Th16 lenses. Use Fujinon FMM-8; Module unit/CFH-3; Grip/CFC-12-990; Cable</small></p>

QR-JVC-Digi battery holder is required.

## ProHD TAPES MiniDV



■ **M-DV63PROHD**  
ProHD tape — 63 mins  
■ **M-DV12CL**  
ProHD cleaning tape


## HARD DISK DRIVES



■ **DR-HD100-40** (40GB - 3-1/2 hrs typical)  
■ **DR-HD100-80** (80GB - 7 hrs typical)


## HD MONITORS

**DT-V Monitors — CRT**



■ **DT-V1710CG** (17")  
■ **DT-V100CG** (10")

**DT-V Monitors — LCD**



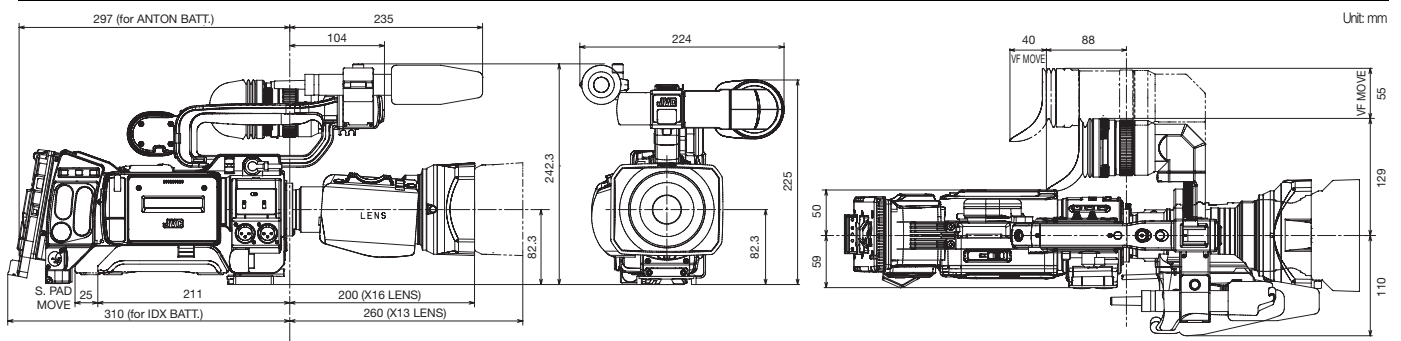
■ **DT-V24L** (24")  
■ **DT-V20L** (20")  
■ **DT-V9L** (9")

**GM-H Monitor — LCD**



■ **GM-H40L** (40")

## DIMENSIONS

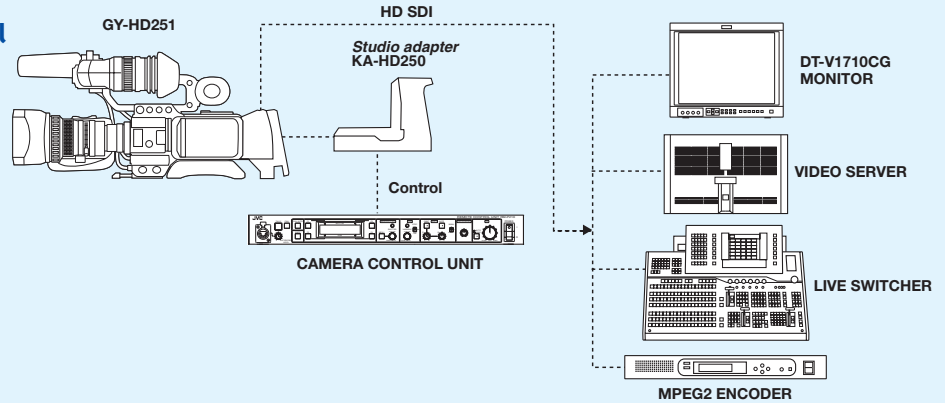


# Typical system configurations



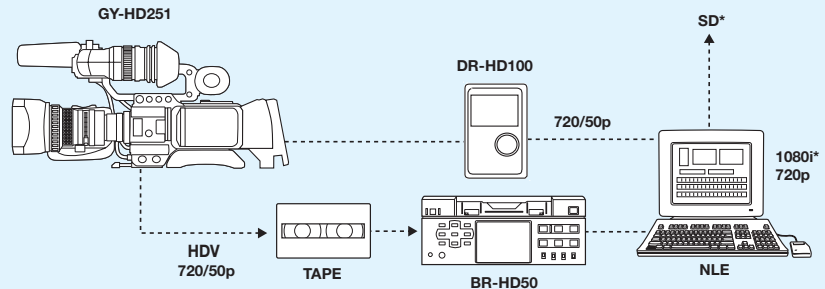
## Studio production with HD SDI and 26-pin control

By combining the GY-HD251 with the KA-HD250 adapter, you can create a studio system with camera control and tally/intercom bi-directional communication via 26-pin multi-core cable. For video/audio transmission, the HD/SD SDI signal allows long-distance digital transmission at 1.5 Gbps with minimal degradation via a separate coaxial cable.



## Live HD recording with tape and hard disk

With 720/50p acquisition capability, you can record smooth, full-frame high-quality images. Also, with genlock input and time code input/output, multi-camera shooting is possible. When the GY-HD251 is combined with the DR-HD100, hybrid (HDD and tape) high-quality ENG with extended recording times is possible.



\*NLE dependant

## HD cinematography with 24 fps and film lenses

In addition to the 24 fps of 720p/24 mode there are two extra gamma settings to choose from, cinema and film out, which gives the captured images a very film-like appearance, according to whether final distribution is on video or on film. With the different film lens mount adapters available, prime film lens can be used, so creating an affordable digital cinematography system. To accommodate certain film lens adapters, the menu allows image inversion.

