No image can tell a story in all its grand presence, minute detail and sheer reality like digital High Definition. High Definition transports you into a big new world of uncompromising quality — where textures and colors come to life with startling and dynamic realism and the subtlest of nuances.

You can see the forest, and the trees, see the leaves, feel them move. That’s power. The power of imaging. The unprecedented power of HD.
Now, JVC lets you capture Hi-Def images yourself. With the solid, compact, ergonomically balanced, enormously easy-to-use GR-HD1, you can go where no Consumer or HD camera has gone before. And at a fraction of the cost of current HD cameras with a signature look different from anything else. Then, with a multitude of avenues for creating, editing, enjoying and sharing your images, you can easily distribute your works to a worldwide audience by HD or regular DVD. HD quality, built to go places. With the GR-HD1 HD CyberCam from JVC, you too can join the world of HD and make digital movies on a level only accessible to cinematographers and broadcasters until now.

**JVC Puts the Power of HD within Your Grasp**

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- Up-convert Output
- * Widescreen or Letterbox
- ** 16:9 DV is Widescreen
- Unconverted

IEEE-1349 i.LINK

Analog Component
Multi-Format Recording and Playback

Up-converter and Down-converter for Versatile Viewing:
- Component Outputs (Y/Pb/Pr), Y/C
- Composite Outputs
- i.LINK and USB for Digital and PC Connectivity

HD MPEG-2
- HD1
- PC
- Display
- SD MPEG-2
- DV

Multi-Format Recording and Playback
JVC’s Definitive Solution for 3-CCD Performance in a Single CCD

JVC puts high quality up front, at the lens. With almost no variance in brightness from F1.8 at full wide to F1.9 at full telephoto, it is able to offer the fundamental image-gathering performance a Hi-Def system requires. High-precision multi-coated all glass optics ensure low-distortion, ghost-free images with high peripheral resolution and brightness, as well as high edge-to-edge color purity across the entire zoom range. Demanding Hi-Def images need to be rock solid, so performance is supported by on-demand Optical Image Stabilization — Optical so as to avoid any loss of resolution — and enthusiasts can take full control with manual focusing and zoom rings on the lens barrel. It’s a crystal clear entry point for breathtaking Hi-Def images.

Hi-Def F1.8 – F1.9 Optically Stabilized Zoom Lens

The “retina” of this camera’s eye is a powerful combination of a 1.18 Megapixel Progressive Scan CCD and JVC’s patented progressive digital filter technology, both the result of JVC’s years of research in the field. Designed for a true 16:9 pixel wide array of 1280 x 720 (for moving images) and 4:3 1280 x 960 (for stills), and progressive scanning to sample the entire picture at once, this CCD has an uncanny ability to capture detailed images without interline motion blur resulting from interlace scanning.

Hybrid Complementary-Primary Digital Filter

Hi-Def color purity and discrete reproduction allows you to see full detail without being obscured by low-resolution color smearing. The Hi-Def standard colorimetric range takes in more colors than NTSC as well. Things simply not possible to see with regular TV, like fine designs on a jersey, are clearly visible. Pictures have texture!

What matters is that the GR-HD1 lets you record, preserve and playback high quality 700/650 Horizontal/Vertical-line resolution (close to the achievable limit of the format) component Hi-Def video in a reasonable price range. To those who still believe that the number of CCDs is the factor in determining picture quality, think again: JVC’s GR-HD1 is ready to challenge and overwhelm preconceptions.

HD Mode MPEG-2 16:9 Image size:
1280 x 720, 840,000 pixels
Recorded Horizontal resolution: 700 16:9 TV lines*, Vertical resolution: 650 TV lines

SD Mode MPEG-2 16:9 Image size:
940 x 480, 460,000 pixels
Recorded Horizontal resolution: 400 16:9 TV lines*, Vertical resolution: 480 TV lines

DV Mode 16:9 Image size:
940 x 480 (Anamorphic Squeeze mode) 460,000 pixels
Recorded Horizontal resolution: 400 TV lines*

4:3 Image size:
720 x 480 standard (360,000 pixels)/940 x 640 wide-angle 30psf (D.Wide) 610,000 pixels
Recorded Horizontal resolution: 540 TV lines
Vertical resolution: 360 TV lines

*See note facing page.
The Hybrid Complementary-Primary progressive color filter system developed by JVC employs a filter matrix overlaying the CCD's picture elements including two complementary colors Yellow and Cyan (Ye and Cy), one primary color Green (Gr), and clear. Shifting one pixel at a time across the CCD and combining these together in pairs for brightness and blocks of four for color delivers maximum resolution. This system's superior ability to sample both Y Luminance and RGB Chroma information results in color performance nearly identical to using three CCDs, proving that it is possible to deliver Hi-Def performance with a single CCD.

Aside from the number of Luminance and RGB Chroma samples, the die-hard 3-CCD enthusiast may wish to point out a higher ratio of Chroma pixels to Luma pixels offered by 3-CCD (1:1 vs 0.75:1). However, this actually turns out to be a moot point since 4:2:0 DV or MPEG-2 encoding inevitably reduces Chroma detail in the R–Y and B–Y color difference components. Both record just one sample each of color for every block of 4 Luma samples. So instead of expending resources on Chroma detail never used in the recording process, JVC concentrated on providing 3-CCD level performance with a single CCD system tailor-made to provide all the color sample and resolution requirements of Hi-Def recording in MPEG-2 format.

Digital MPEG-2 Hi-Def and SD Recording

While the picture is encoded one frame at a time for DV, the time axis is encoded as well for MPEG-2, conforming to the HD Digital VCR Conference’s Part 7 (DVB) and Part 8 (ATV) standards. The GR-HD1 uses a GOP (Group Of Pictures) of 6 for HD and 12 for SD, with a frame order of IBBPBB. The “I frame” is a complete frame without reference to any past or future frames; the “P frame” is encoded relative to the past reference frame; and the “B frame” is encoded relative to the past reference frame, future reference frame, or both.

MPEG-2

In HDTV, high power MPEG encoding eliminates redundant information over time.

I : I Frame (Intra Coded Frame)
B : B Frame (Bi-directionally Predictive Coded Frame)
P : P Frame (Predictive Frame)

Hi-Def MPEG-2 on MiniDV Cassette

This was made possible since the “Hi-Def MPEG-2 on MiniDV” encoder and decoder developed by JVC together with NTT records Hi-Def Component MPEG2-TS signals in the same track format as DV.

High-Speed Search Playback Possible

The “I frame” can be played back without using any other frame and is recorded in the appropriate variable-speed playback area on the tape, allowing high-speed search during playback.

The difference between HDTV TV lines and regular TV lines.

All “TV line” standard measurements are relative to the diameter of a circle the same size as the picture height. HDTV 16:9 Horizontal TV lines figures appear to be 75% of what the equivalent 4:3 Horizontal TV Lines would be if the measurement was relative to the whole picture width, since the image is wider. (For example, for the GR-HD1 HD mode would be around 1244 TV lines per picture width, while the count would be about 933 TV lines per picture width for a 4:3 camera if both had 700 TV lines counting by standard horizontal resolution). DV has a practical recorded horizontal limit of 540 4:3 TV lines, 1280x720p HD has a practical recorded limit of 720 16:9 TV lines using the standard measurement method.
Capture Your HD Footage and Captivate Your Audience

JVC Hi-Def camcorder users don’t just film digital movies, they create them! The HD revolution is carried on the shoulders of a new wave of creativity unleashed by today’s high powered production software. The GR-HD1’s capture, editing and DVD authoring software provides capabilities only Pro’s could take for granted until now, and fills out an equally important part of the basic low cost system. And compatibility with well accepted industry standard production software is already possible, with greater integration on the way.

i.LINK interface. One can also record MPEG2-TS images back to tape. It also automatically stores data in separate files should it detect different data types or unrecorded sections during capture.

Seamless Frame-Accurate Digital Editing with MPEG Edit Studio™ Pro LE

This NLE (Non-Linear Editing) application allows frame-accurate MPEG-2 editing with intuitive drag-and-drop operation.

Coupled with the search functions accompanied by sound, you’ll be able to make frame-accurate cuts with precise voice timing so you won’t cut off a crucial comment or quote prematurely.

Video and audio can be edited separately, and combined from different clips.

In addition to the incredibly easy drag-and-drop interface, you’ll find numerous features that enable easy project management so you can store and revise your past work whenever necessary. And thanks to the edit spooler function, edits can be done in the background, freeing up you and your computer for other jobs and letting you use your time more efficiently.

HD Capture Software

Hi-Def footage recorded with the GR-HD1 is easily transferred to your computer’s hard disk using on-screen camera control buttons, via IEEE1394.
Your edited HD Movies make the best possible DVDs

Progressive HD looks great converted to interlace NTSC DVDs. And DVD Authoring is easy with ImageMixer DVD. The software handles MPEG2-PS files created in MPEG Edit Studio™ Pro LE without the need for re-encoding. Down-converted MPEG-2 files can be authored to DVD simply by dragging and dropping the files onto the menu. Just choose from the variety of ready-made frames and graphics, and it automatically creates a main menu for DVD playback. ImageMixer DVD discs can be played on most ordinary home DVD units depending on the player and disc.

Editing of both HD and SD material is possible, so you can export edited HD videos back to the GR-HD1 or to a JVC HM-DH40000/DH30000 Digital HDTV Video Recorder in native MPEG2-TS Hi-Def format, as well as convert edited HD videos to NTSC MPEG2-PS for authoring to DVD using the provided ImageMixer DVD software.

**Full Digital Interfaces**
The GR-HD1 is excellent at getting the images and sounds you need to the location where you need them.

Live HD images at 720/30p can be monitored digitally via the i.LINK connector (Analog output is also possible for playback from tape)

i.LINK (IEEE 1394) is primarily for transfer of MPEG-2 and DV video data to and from a PC or other compatible device like a D-VHS VCR. (Dubbing is not possible from analog HD sources). You get lossless digital dubbing of both pictures and sound in one cable. Connected to JVC’s HM-DH40000/DH30000, it allows 4 hours of dubbing onto a D480 D-VHS tape (DV MPEG max. 25Mbps → D-VHS MPEG max. 28Mbps).

USB for transfer of digital still images to and from a PC.

**SD or MMC Memory Card** for storage of digital stills and transfer of data to PC with appropriate slot or external reader.

**Web-Camera Function**
Communicate via web-camera by running third party applications such as Windows® Messenger for teleconferencing, video phoning, webcasting or surveillance.

**Import Soundtracks with Audio Converter 1.0**
Lets you import MP3 files, as well as other audio file formats (WAV, WMA, MP2), with full sound mixing and editing support, for use in your movie soundtrack in the MPEG-1 Audio Layer 2 format used by MPEG Edit Studio™ Pro LE.

The predictive encoding nature of MPEG, and thus the lack of complete picture information for each frame, has long been considered a factor making frame-accurate MPEG edits impossible. But MPEG Edit Studio Pro LE uses highly efficient coding to make handling and editing of high data rate HD signals possible, and solves the issue of addressing each frame individually by synthesizing frame data based on surrounding frames to complete the picture. With MPEG Edit Studio Pro LE, edit cuts can start with any type of frame, without any image freeze even if an “I frame” isn’t used.
Rotating Grip
Transition from a high to low angle shot without removing your hand from the grip or taking your eyes off the action. Find that most comfortable and stable shooting position. Get HD footage in places and angles that bulkier cameras just won’t allow.

Removable Carrying Handle and Accessory Shoes
Aluminum die-cast carrying handle for high action mobility; upgrade camera or handle shoe with options like MV-E100 microphone.

Lens Hood
Cuts lens flare for superior results.

High Resolution LCD Color Monitor and Color Viewfinder
With the rotating 3.5” high-resolution 2 Megapixel LCD monitor, you can shoot at angles and positions where the viewfinder isn’t comfortable or practical. The LCD monitor can be viewed simultaneously with the viewfinder including comprehensive menu and camera condition information, especially convenient when working with others. The crisp, brilliant color viewfinder has a diopter to adjust for eyesight.

Power-Linked Operation — with Tally Lamp, Beep or Melody
Pull out the viewfinder or open the LCD monitor and the camera automatically powers up so you’re ready to shoot. Close — power automatically shuts off to save energy.

If needed, beep or melody sounds signify power-on and recording signaled by the tally lamp as well as a beep or melody. A shutter sound can indicate still shooting.

Manual Focus Ring & Zoom Ring
Individual lens barrel rings adjust focus and zoom. Auto focus and power zoom can be activated at anytime.

Manual/Auto Shutter Speeds, Iris, White Balance
Shutter speeds range from 1/15 and the filmic 1/30, all the way up to 1/1000 sec. Iris ranges from F1.8 through F22.0 with an Iris Lock function. In addition to One-touch manual white balance; Halogen, Cloudy and Sunny settings finely tune colors for a more natural look. All are directly accessible by conveniently mounted buttons.

Manual Exposure, Back Light Compensation and Program AE
You have total control over image exposure in ±10 steps using the exposure dial, and can instantly compensate for backlighting via the BLC button. Program Auto Exposure includes Sports, Snow, Spotlight and Twilight to best match the scene.

Full Auto Modes
Just set to cruise control and let the camera take care of all critical settings.

HD and SD mode MPEG-1 Layer2 16bit Digital Stereo Audio/DV mode PCM Digital 2 or 4 channel Audio
Record wide dynamic range 48kHz digital audio with the camera’s stereo microphone or via external stereo mini-plug mic input. HD and SD modes record at 384 kbps. DV mode also records in 2 channel 48kHz or the 32 kHz 4 channel mode for post audio dubbing. Wind cut mode helps cut down wind created noise. Monitor by stereo headphone jack.

Manual/DV Mode Digital Still 10x Zoom plus SD/DV Mode Digital 40x/200x Zoom
Get close with the stabilized all glass 10x optical zoom, plus for SD and DV mode 40x/200x digital zoom with spline interpolation to minimize jagged edges.

DV Mode 16:9 Anamorphic Wide
In DV mode, 16:9 “Squeeze wide” uses a wider view of the CCD (941x483 pixels) to create a full 16:9 image. This is then fit into the regular 4:3 NTSC signal to make a natural electrical anamorphic “squeezed” image to play back on a 16:9 TV at 60i.

DV Mode 4:3 Digital Wide
Digital Wide’s broader pixel area (941 x 646) generates a high-resolution wide-angle image equivalent to a 0.7x wide conversion lens. The frame rate is 30fps output on 60i, with increased sensitivity.

HG Digital Stills
Progressive CCD recording captures digital stills a frame at a time so they have less motion blur and 1.5 times the vertical resolution of conventional field stills from an interface camera. The Optical Image Stabilizer also helps shooting without blur from camera motion when zoomed in.

• Four sizes are captured to SD memory card or MMC MultiMediaCard; VGA 640 x 480, Panorama 16:9 848 x 480 or 1280 x 720, and Megapixel 1280 x 960 still pictures.
• Progressive pictures captured from tape to PC also make high quality stills; HD at 1280 x 720, SD 848 x 480. DV stills; 640 x 480.
• For Index playback and file viewing, File information includes Folder, File, Date made, Image size, Picture quality, and Protect mode. On screen display is possible.
• Digital Print Order Format (DPOF) ready.
Navigation, On Screen Display
An index picture and counter information are stored on the SD Memory Card when you start shooting video, push the Index button, or at regular intervals. To search video footage, just call up the navigation screen and choose the scene you want. Date, Time and Time-code are always recorded to tape, selectable for display onscreen with the LCD, viewfinder or connected TV.

Built-in Digital Effects and Scene Transitions
In addition to Black and White “Monotone” effect for HD and Digital Still modes, SD and DV modes also have Sepia, Classic Film and Strobe effects and 9 transitions you can apply both in the field shooting or during playback — White/Black and Color Fades; Corner, Window, Slide, Door Scroll and Shutter Wipes.

DV and Digital Still Camera mode Playback Digital Zoom, and DV Mode Playback Effects
Blow up by as much as 20x part of a Still or DV picture right in the LCD or connected monitor. Playback effects via the camera’s multi-brand compatible remote control include Slow speed search, Frame by frame viewing, Classic Film, B/W Monotone, Sepia and Strobe.

Also
- Macro shots as close as 2 inches (5cm) from lens. Tele-macro close-ups from 2 feet (60cm) away.
- Gain Up mode
- At intervals of 5, 15, 30 or 60 seconds or manually, the 5-Second Recording mode records events in 5 second clips. Similarly, Animation mode records a few frames.
- DV LP mode provides 1.5x recording time
- Self Timer
- Blank Search locates empty tape sections.
- Tape Remaining Time Indication
## Specifications

### Recording system
- Mini DV format, HD Digital VCR Conference’s Part 7 (DVb) and Part 8 (ATV) standards, DVC-SD, DVCART/ DVC compliant

### Digital / component
- Format: HD: X 29.7 / 8650 TV Line, SD: X 29.7 / 720 lines / actual fps
- Video format recording / playback:
  - HD/SD mode: 1280 x 720 / 720 / 850 TV Line / 848 / 59.94 / 29.7 (Analog "squeeze" or "squeeze" depending on component output)
  - DV mode: 640 x 480 / 480 / 59.94 (16:9 is anamorphic "squeeze" only)

### Digital Audio signal recording
- HD, SD mode: MPEG1 Layer2 16 bit Stereo, 384 kbps
- HD/SD bit rate: 19.7 Mbps Transport Stream (MTRM Standard compatible with D-VHS)
- Video format recording / playback:
  - HD: 1920 x 1080 / 11503 (Aspect Ratio: 16:9)
  - SD: 720 x 480 / 540 / 480 (Aspect Ratio: 16:9 / 16:9 or 4:3)

### Image sensor
- 1/3 inch Progressive CCD: 1.18 million-pixel CCD
- Area for motion: 1280 x 720 (max) in memory mode
- Area for still pictures: 1280 x 960

### Lens
- F1.8—F1.9, when compared to a 35mm still camera:
  - 40.3mm — 400mm in 16:9 HD mode
  - 55.5mm — 550mm in 16:9 SD mode and 16:9 HD Anamorphic mode
  - 67.8mm — 678mm in 4:3 DV mode
  - 47.1mm — 477mm in 4:3 Digital Still mode

### Zoom magnification
- 10x Optical zoom, 100x digital zoom

### Filter Diameter
- 52mm

### Digital Audio output
- USB: Mini-USB B-type (5 pin)

### I/O terminals
- i.LINK (4pin (IEEE1394 conforming) S400)
- Viewfinder: 0.44" color LCD viewfinder (113,000-pixel polycrystalline silicon LCD)

### STILL Picture Format
- JPEG compliant (DPI Print Order Format)

### Power consumption
- HD/SD mode: 8.0W (using viewfinder), 9.7W (using LCD monitor)
- DV mode: 6.8W (using viewfinder), 8.5W (using LCD monitor)

### Continuous (Actual) recording time

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<td>1 hr. 15 min.</td>
<td>37 min.</td>
<td>1 hr. 30 min.</td>
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**Note:** Continuous recording time, actual recording time, and number of still pictures are approximate.

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