

# JVC

GY-HM650SC  
Pro HD Sports Coaching Camera  
**ProHD**



**XOS**  
DIGITAL

VIDEO EDITING  
**THUNDER HD**

## *The fastest way to a winning game plan*

JVC's new ProHD GY-HM650SC sports coaching camera is the first professional camcorder made to interface with XOS Digital's Thunder HD video coaching software—the premier video editing platform used throughout professional and amateur sports. Built to streamline the sports video coaching process, the GY-HM650SC can seamlessly interface with Thunder HD by embedding UTC time stamp as well as ODK and other data in the recordings.

*"The powerful combination of XOS and JVC allows teams to spend less time organizing data and more time coaching," — Matt Bairos, CEO of XOS*

**JVCKENWOOD**



Coaches want to analyze clips *immediately* after the game ...

JVC's GY-HM650SC sports coaching camera *makes it happen!*



**XOS** VIDEO EDITING  
DIGITAL THUNDER HD

**JVC** VIDEO CAPTURE  
GY-HM650SC

## *A New Era of Video Coaching Technology*

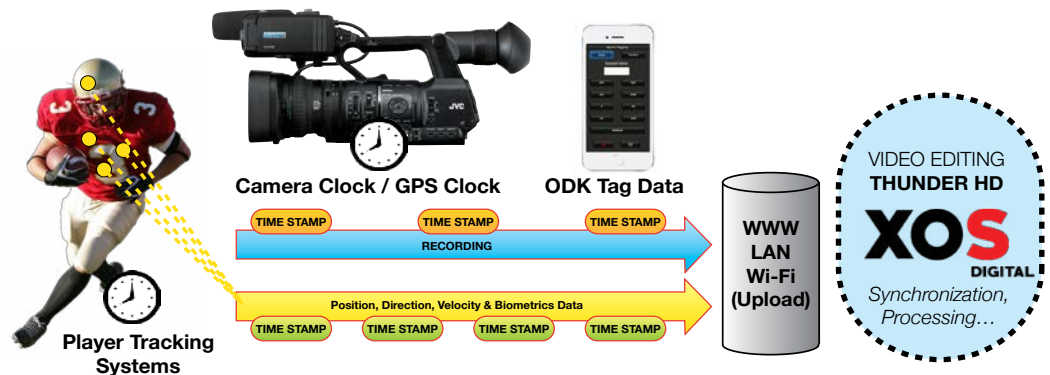
### XOS Digital and JVC Partner to Create Sports Coaching Video Solution

Technology is fast changing the way sports teams prepare for individual games and entire seasons. A single decision can often mean the difference between winning and losing, and more often than not it is the better prepared team that prevails. **XOS Digital** is the leading provider of the tools that allow coaches and players to be ready and make winning game day decisions. In their continuing effort to provide their partners in the NFL, NCAA, and NHL with cutting-edge video technologies, **XOS** has partnered with **JVC** to make the GY-HM650SC the ideal companion camera for their renowned pro and amateur sports coaching video platform, **Thunder HD**.

The GY-HM650SC, with built-in GPS capability, is like no other camera on the sports coaching market today as it can retrieve coordinated universal time (UTC) via satellite and embed a real-time reference within the video metadata. Metadata can also be synchronized with multiple cameras and biometric data collected by player tracking systems. This actual time of day (UTC) collected by the GY-HM650SC is essential data for the metrics used in player tracking and biometrics recording systems. Having this ability built into the camera makes the **Thunder HD** platform more efficient, allowing coaches to instantly find key plays and biometric data.

## Play Specific Metadata Can Be Added Via an Intuitive Mobile GUI

In addition to the ability to include UTC time-stamp data in its recording, the GY-HM650SC can add ODK and other tag specific information related to the type of play (offense, defense, kickoff, play number, etc.) via an intuitive mobile GUI and embed it in video clips as metadata. This metadata can then be interpreted by the **Thunder HD** program, allowing the system to automatically categorize and separate plays into the appropriate folders. This process can save hours of post-recording cutting and tagging from the traditional coach workflow.



## Wi-Fi and Broadband Connectivity with Advanced Streaming

To avoid time consuming uploads, coaches can stream footage directly to the analytics platform via 4G LTE connection or Wi-Fi using the GY-HM650SC's built-in IP tools. As a result, footage does not have to be uploaded manually, so coaches and players can review footage as soon as the game or practice is complete. Plus, high-quality HD footage is simultaneously recorded to SD cards in the camera for backup.

## Thunder Friendly Recording Format: 8 Mbps, 720p/60p

In addition to standard full HD 1920 x 1080 recording the GY-HM650SC is also able to record at the Thunder-friendly Quick Time (H.264) 1280x720/60p(LP) or 50p(LP) at 8 Mbps.

## High Performance Full HD 1/3-inch CMOS Sensors

At the heart of the GY-HM650SC are three, 1/3-inch CMOS sensors, each capable of capturing full HD 1920 x 1080 resolution images. Offering an excellent sensitivity of F11 (60Hz) /F12 (50Hz) and a remarkable signal-to-noise ratio, the devices provide superior precision and color reproduction.

## Integrated 23x Fujinon Auto Focus Zoom Lens with Manual Functions

The GY-HM650SC is equipped with a full range 23:1 Fujinon wide angle lens. Delivering superior low-light performance and ensuring brightness at the tele end, the lens offers F1.6-3.0, a focal range of 29mm-667mm (35mm equivalent) and includes servo zoom, manual focus, and iris rings, along with a four-position (clear, 1/4, 1/16 and 1/64) ND filter. Other features include an optical image stabilizer and chromatic aberration correction. The GY-HM650SC's long zoom range means that you can get shots of the game not possible with other cameras its size.

### *Integrated Fujinon Lens with 23x Optical Zoom*

Original Image No Zoom



14X Optical Zoom



23X Optical Zoom



*The GY-HM650SC full range 23:1 Fujinon lens is perfect for getting tight close up shots in the game!*

# GY-HM650SC Sports Coaching Camera

## Dual SDHC/SDXC Card Slots

The GY-HM650SC can create hours of pristine recordings to affordable non-proprietary SDHC/SDXC media. Having dual SDHC/SDXC card slots makes it truly versatile as a sports camera, offering such benefits as simultaneous recording and relay recording, in which you can shoot the game continuously over multiple cards—Perfect for overtime!



**GY-HM650SC** **XOS DIGITAL** VIDEO EDITING  
**THUNDER HD**  
ProHD sports coaching, live stream capable,  
handheld camera w/integrated 23x Fujinon zoom lens



### Key features

- Extensive metadata recording capability (*Allows insertion of metadata XOS Thunder platform*)
- 1/3-inch 12-bit CMOS sensors (1920 x 1080 x 3)
- GPS receiver with UTC metadata recording
- F11 Sensitivity
- 23x Fujinon Auto focus zoom lens w/manual functions
- F1.6-3.0, 23x, f=4.1-94.3mm (35mm conversion: 29 to 667mm)
- Optical image stabilizer
- 3 position ND filter (1/4, 1/16, 1/64)
- 0.45-inch 1.22M pixel color viewfinder
- 3.5-inch 920K pixel LCD display with focus assist
- SDXC/SDHC memory card recording (*2 slots for dual-backup, continuous recording*)
- Large file size support with SDXC card
- 50Mbps H.264 Extreme High Quality mode (XHQ)
- Dual Codec: Recording simultaneously HD + SD or HD + 480 x 270 (for Web delivery)
- Live streaming w/advanced Zixi error correction and adaptive bitrate control
- High bitrate streaming (up to 12 Mbps)
- Background FTP clip transfers while recording
- RTMP protocol streams directly to USTREAM, YouTube
- **Multiple encoding formats:**
  - HD MPEG2 (35/25/19Mbps)
  - AVCHD 1920x1080 60i
  - 1080/60p recording capability
  - Quick Time (H.264) 1280x720/60p(LP) or 50p(LP)
  - SD H.264
  - 480x270 H.264 (web)
  - 960x540 H.264 mode
- **Wide media format compatibility:**
  - .MXF with rich Metadata (optimized for asset management)
  - .MOV (Final Cut Pro)
  - .MP4 (XDCAM EX™)
  - AVCHD with additional lower bitrate AVCHD modes
- Clip trimmer (basic editor)
- Professional switch layout and comprehensive video settings
- Pre Rec (retro) mode (15 sec.)
- Interval (time lapse) recording
- Built-in stereo microphone(mic/line switchable) w/phantom power supply
- HD/SD-SDI, HDMI Outputs
- Wired remote control connector
- FTP file upload via Wi-Fi or Broadband

**Notes:** XOS Digital Inc. logos and Thunder HD are trademarks of XOS Digital Inc. Apple, Apple logo, Macintosh, QuickTime, and Final Cut Pro are trademarks of Apple Inc. registered in the United States and other countries. "AVCHD Progressive/AVCHD" and the "AVCHD Progressive/AVCHD" logo are trademarks of Panasonic Corporation and Sony Corporation. Dolby is a registered trademark of Dolby Laboratories. The SD, SDHC and SDXC logos are trademarks of the SD Card Association. HDMI, the HDMI Logo, and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing LLC in the United States and other countries. All product and company names mentioned here are trademarks or registered trademarks of their respective owners.



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