### CANON EOS 1D MKIV

- **Effective Pixels**: 16.10 million (4896 x 3264)
- **Sensor Size**: CMOS (APS-H) 27.9x18.6mm (crop factor 1.3)
- **Processor**: Dual DIGIC 4 processors
- **Chroma Subsampling**: 4:2:0
- **HD Recording**: 1920x1080 @ 44Mbps
- **Recording Size**: 1920x1080 (Full HD) 30p/25p/24p, 1280x720 (HD) 60p/50p
- **Recording Times**: The recording will stop automatically once the file size reaches 4GB or if the clip reaches 29 min 59 sec in duration.
- **Native ISO**: 160, 320, 640, 1250, 2500, 5000, 10,000
- **Audio Recording**: AGC (automatic gain control)

### CANON EOS 5D MKII

- **Effective Pixels**: 21.10 million (5616 x 3744)
- **Sensor Size**: CMOS (Full-Frame) 36x24mm (crop factor 1.0)
- **Processor**: DIGIC 4 (single)
- **Chroma Subsampling**: 4:2:0
- **HD Recording**: 1920x1080 @ 44Mbps
- **Recording Size**: 1920x1080 (Full HD) 30p/25p/24p, 640x480 30p/25p
- **Recording Times**: The recording will stop automatically once the file size reaches 4GB or if the clip reaches 29 min 59 sec in duration.
- **Native ISO**: 160, 320, 640, 1250, 2500, 5000
- **Audio Recording**: Manual (firmware upgrade)

### CANON EOS 7D

- **Effective Pixels**: 18 million (5184 x 3456)
- **Sensor Size**: CMOS (APS-C) 22.3x14.9mm (crop factor 1.6)
- **Processor**: Dual DIGIC 4 processors
- **Chroma Subsampling**: 4:2:0
- **HD Recording**: 1920x1080 @ 44Mbps
- **Recording Size**: 1920x1080 (Full HD): 30p/25p/24p, 1280x720 (HD) 60p/50p
- **Recording Times**: The recording will stop automatically once the file size reaches 4GB or if the clip reaches 29 min 59 sec in duration.
- **Native ISO**: 160, 320, 640, 1250, 2500, 5000
- **Audio Recording**: AGC (automatic gain control)

* Dual processors allow for rapid fire continuous shooting > 1DMKIV = 10fps & 7D = 8fps. The 5DMKII (single processor) is only 3.9fps.

### Positives

- Shallow Depth of Field
- Price Point of camera & accessories which greatly vary in quality.
- Use of many affordable lenses, both old & new, zooms & primes.
- Inexpensive recording media in CF &/or SD Cards.
- The listed DSLR cameras are both a Stills & Video cameras.
- The ability to record high resolution stills & build time-lapse sequences in FCP etc.
- Small in size in comparison to other video cameras.
- Lovely natural tones unlike most ‘video’ cameras.
- Usability > very easy to use.

### Negatives

- Line-skipping > DSLR cameras squeeze a monstrous still image down to a 1920x1080 HD video image. In the 5DMKII’s case the 21 megapixel sensor is downsampled to HD resolution by only using every third line & 4:2:0 chroma subsampling leading to possible Moiré patterns in recorded video.
- Rolling Shutter > Rolling Shutter issues are commonly found in CMOS chip cameras. The sensor in these three DSLR Cameras have a very slow refresh rate, resulting in ‘skew’ & ‘wobble’ effect. Of the three cameras the 1DMKIV holds up best. Rolling Shutter is a method of image acquisition in which each frame is recorded not from a snapshot of a single point in time, but by scanning across the frame either vertically or horizontally. Not all parts of the image is recorded at exactly the same time. This produces distortions of fast moving objects or when the sensor captures rapid flashes of light. This method is implemented by rolling the shutter across the exposable image area instead of exposing the image area all at once.
- H.264 Compression > QuickTime MOV H.264/MPEG 4 is a compression codec that is mostly used for web. However, as it has the ability to be adjusted to different frame rates, data rates & resolutions, it is the basis for a lot of other outlets - BluRay, iPhone, iTunes, etc. At the moment it is certainly the codec of choice for data to quality ratio. It is possible that H.264, at a higher data rate, would be a reasonable acquisition format, but at the rate it is used on the stills cameras it is heavily compressed & leaves little room to move in post (very little latitude & colour information). DSLR’s need to be shot accurately on the day because you can't push anything around more than about 10% without it falling apart.
- Confusion between models > Features vary from model to model, plus all three listed DSLRS have different crop factors, strengths & weaknesses.
- Lack of traditional video features > Timecode, zebra patterns, markers, viewfinder, servo zoom lenses, manual audio (5DMKII exception), multiple video outputs & lack of long recordings. However, ‘Magic Lantern’ offers free firmware that incorporate some of these features - [http://magiclantern.wikia.com](http://magiclantern.wikia.com)
- Over Heating > When recording for long periods, especially in warmer conditions, all three of these DSLRs will experience CMOS overheating & an increase of video noise may occur. Out of the three the 1DMKIV is a better build & is less prone to overheat. Canon considered this camera to be their pro camera.
This document was especially created for the ASC [SA] Trade Night held on July 8, 2010. It was compiled by Pete Hall (Picture Hire Australia) with contributions from David Ngo (The Cutting Room) & Steve Huddy (Canon Australia (SA)).
**SENSOR SIZES**

<table>
<thead>
<tr>
<th>Camera</th>
<th>Sensor Type</th>
<th>Size</th>
<th>Crop Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canon EOS 5DMKII</td>
<td>35mm Full-Frame CMOS Sensor</td>
<td>36 x 24mm (diagonal 43mm)</td>
<td>1.0</td>
</tr>
<tr>
<td>Canon EOS 1DMKIV</td>
<td>APS-H size CMOS Sensor</td>
<td>27.9 x 18.6mm (diagonal 34.5mm)</td>
<td>1.3</td>
</tr>
<tr>
<td>Red One</td>
<td>Super 35mm size CMOS sensor</td>
<td>24.4 x 16.8mm (diagonal 30mm)</td>
<td>1.55</td>
</tr>
<tr>
<td><em>Sony F35</em></td>
<td>Super 35mm size CCD Sensor (x3)</td>
<td>23.6 x 15.6mm (diagonal 27.1mm)</td>
<td>1.58</td>
</tr>
<tr>
<td>Canon EOS 7D</td>
<td>APS-C size CMOS Sensor</td>
<td>22.3 x 14.9mm (diagonal 26.7mm)</td>
<td>1.6</td>
</tr>
<tr>
<td>Panasonic AG-AF100</td>
<td>Micro 4/3&quot; MOS Sensor</td>
<td>17.3 x 13mm (diagonal 21.6mm)</td>
<td>2.0</td>
</tr>
<tr>
<td>Sony PDW-F800 XDCAM</td>
<td>2/3&quot; CCD Sensor (x3)</td>
<td>8.8 x 6.6mm (diagonal 11mm)</td>
<td>3.9</td>
</tr>
<tr>
<td>Sony PMW-EX1/3 XDCAM</td>
<td>1/2&quot; CMOS Sensor</td>
<td>6.4 x 4.8mm (diagonal 8mm)</td>
<td>5.41</td>
</tr>
<tr>
<td><em>same as Genesis</em></td>
<td>Calculations are in some cases approximates</td>
<td>Example » To calculate the crop factor of a 2/3&quot; sensor; 43mm ÷ 11mm ≈ 3.9</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- 35mm Full-Frame is referring to Full-Frame stills not Full-Frame motion.
- Many things contribute to image quality; the size of the sensor is only part of it.
- Large sensor benefits are:
  - Dynamic Range – Large sensors have the ability to reproduce detail in both very low & very high light levels.
  - DoF – Large sensors have a shallower depth of field than that of a smaller sensor.
  - Sensitivity – Large sensors capture more light therefore are more sensitive than smaller sensors.