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DxOMark review for the Pentax K5

Friday November 05 2010

From the outside, the new Pentax K5 looks exactly the same as the K7. The main differences lie inside: the K5 uses the brand-new 16.3 MP sensor (able to operate between ISO 80 and 12800, extended to 51200), an improved SAFOX 9 AF system, a higher burst speed, and a much better video mode that can record 1080p footage at 25 fps.

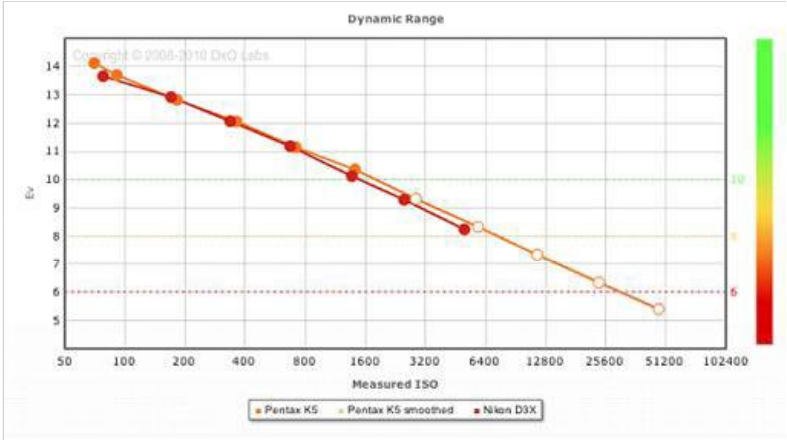
The best APS-C in all tested fields

No need for suspense: this new 16.3 MP sensor is simply the best APS-C we have tested so far, sometimes able to compete even with very high-end full-frame cameras.

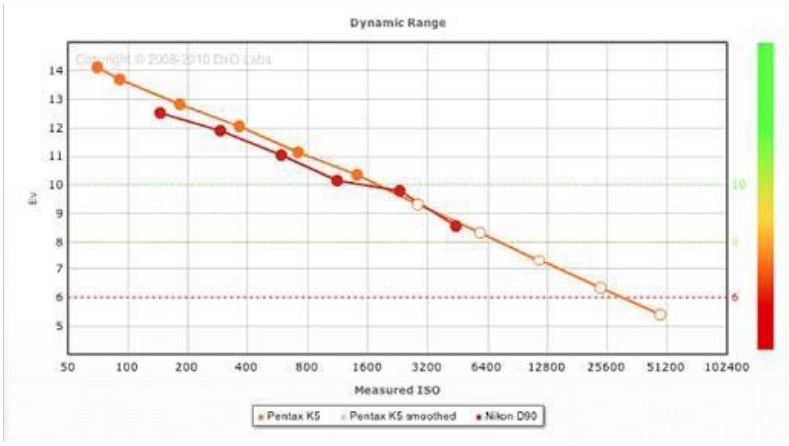
The overall score of the K5 puts it in the lead with 82 points — more than 9 points better than the D90 or the Alpha 55, and 16 points ahead of the Canon 7D or 60D. The K5 is literally the best APS-C performer for segment, even in low ISO.

Wonderful Dynamic Range performance

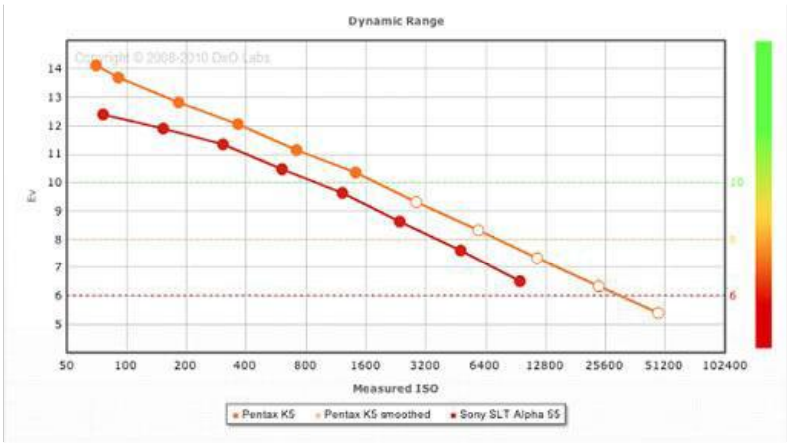
Dynamic range is clearly where the K5 struts its stuff. The scores it reaches at ISO 80 are simply impressive: at 14.1 Ev (print mod even the D3X's full-frame sensor is not that good. Smoothing appears at ISO 3200 but does not impact the metrics.



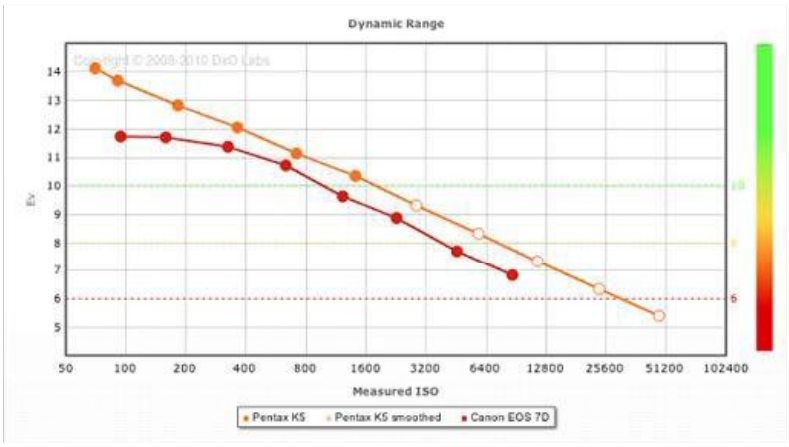
K5 vs D3x – Dynamic Range: the $1300 APS-C Pentax has a better dynamic range than Nikon's $9000 full-frame flagship.



D90 – Dyamic Range: The APS-C sensor in the K5 surpasses that of the D90 and shows impressive figures between ISO 80 and 200.



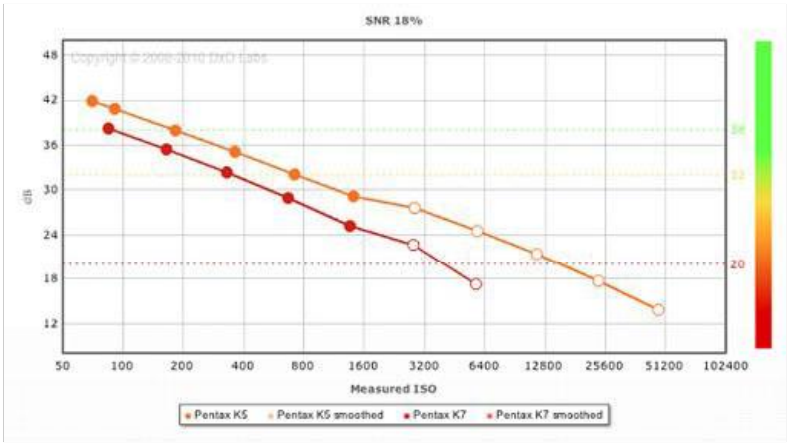
K5 vs Alpha 55 – Dynamic Range: the K5 is always at least 1 EV above the A55.



K5 vs EOS 7D – Dynamic Range: at ISO 100, the K5 is above by 2 EV, and stays ahead by almost 1 EV all across the range.

ed high ISO performance ...

gest weakness for the K7 was its average high ISO performance. The K5 addresses this by reaching a solid 1162 ISO.



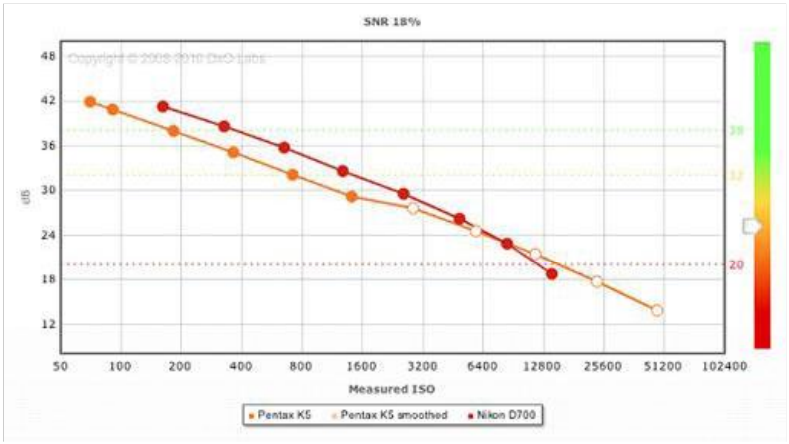
7 – SNR: The difference is obvious — and consequential. For a 32 dB result, the K5 can climb to ISO 800, while the K7 stops at ISO 400. The K5 still shows a very good SNR at ISO 1600.

ull-frame sensors remain the best for high ISO operation

e K5 may be the best APS-C competitor, its excellent "small" sensor does not manage to close the gap with the good 24x36 in area where size still matters.

as it is, the K5 sensor isn't still quite up to its solid full-frame competitors, being roughly one stop behind a D700 or a 5D MkII.

imagine how promising the K5 technology could be in a full-frame body: increased picture quality associated with solid high ISO ance —a dream!



s D700 – SNR: the best APS-C sensor versus a strong full-frame. ISO 3200 on a D700 gives the same SNR value as 1600 on the K5.

ner: This dxomark review evaluates only the selected camera's RAW sensor performance metrics (i.e., Color Depth, Dynamic and Low-Light ISO), and should not be construed as a review of the camera's overall performance, as it does not address such portant criteria as image signal processing, mechanical robustness, ease of use, flexibility, optics, value for money, etc. While nsor performance is critically important, it is not the only factor that should be taken into consideration when choosing a digital

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K5	D7000	EOS 60D

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Overview | ISO Sensitivity | SNR 18% | Dynamic Range | Tonal Range | Color Sensitivity

Pentax K-5

DxOMark Sensor Scores

Overall Score	82
Portrait (Color depth)	23.7 bits
Landscape (Dynamic range)	14.1 Evs
Sports (Low-Light ISO)	1162 ISO

Manufacturer specifications

Launch date	2010-09-20
Indicative price	1374 USD
Resolution	16 Mpix (4992 x 3284)
Pixel pitch	4.75 µm
Bits per pixel	14
Focal length multiplier	1.52
ISO latitude	80 - 51200
Frame rate	7 fps

Nikon D7000

DxOMark Sensor Scores

Overall Score	80
Portrait (Color depth)	23.5 bits
Landscape (Dynamic range)	13.9 Evs
Sports (Low-Light ISO)	1167 ISO

Manufacturer specifications

Launch date	2010-09-15
Indicative price	1300 USD
Resolution	16 Mpix (4991 x 3280)
Pixel pitch	4.73 µm
Bits per pixel	14
Focal length multiplier	1.53
ISO latitude	100 - 25600
Frame rate	6 fps

Canon EOS 60D

DxOMark Sensor Scores

Overall Score	66
Portrait (Color depth)	22.2 bits
Landscape (Dynamic range)	11.5 Evs
Sports (Low-Light ISO)	813 ISO

Manufacturer specifications

Launch date	2010-10-01
Indicative price	1130 USD
Resolution	17 Mpix (5194 x 3464)
Pixel pitch	4.29 µm
Bits per pixel	14
Focal length multiplier	1.60
ISO latitude	12800 - 100
Frame rate	5.3 fps

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Camera Sensor rankings with DxOMark Scores

Four different DxOMark Scores to rank camera sensors at RAW level are available: The Sensor Overall Score, showing the performance for a general purpose use case, the Portrait Score based on Color Depth, the Landscape Score based on Dynamic Range and the Sports Score based on Low-Light ISO.

Camera filters: APS-C/1.3 | All Brand | Mpix | Price

Change view: Graph | List | Details

Image	Brand	Model	Mpix	Sensor Format	Price USD	Overall Score	Portrait (Bits)	Landscape (EVs)	Sports (ISO)
	Pentax	K5	16	Full format	1374	82 (6)	23.7 (11)	14.1 (1)	1162 (13)
	Nikon	D7000	16	Full format	1300	80 (10)	23.5 (15)	13.9 (2)	1167 (14)
	Canon	EOS 1D Mark IV	15	Full format	5840	74 (19)	22.8 (27)	12 (29)	1320 (11)
Sony SLT Alpha 55	Sony	SLT Alpha 55	16	Full format	824	73 (20)	23 (21)	12.4 (17)	816 (27)
	Nikon	D90	12	Full format	1235	73 (21)	22.7 (32)	12.5 (17)	977 (19)
	Nikon	D5000	12	Full format	730	72 (22)	22.7 (30)	12.5 (15)	868 (24)
	Pentax	Kx	12	Full format	640	72 (23)	22.8 (27)	12.5 (14)	811 (29)

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What is DxOMark?

DxOMark at a glance

DxOMark consists of a comprehensive RAW-based image quality Measurement Database and a set of Scores to evaluate and compare digital cameras and lenses.

Why trust DxOMark?

When looking for digital camera image quality evaluation data and benchmarks, you want to be sure that the provided measurements have been openly and objectively performed by a completely independent testing operation that uses state-of-the-art equipment and follows industry-standard methods.

Lens manufacturing variability and DxOMark

Does manufacturing variability impact DxOMark lens measurements and scoring?

What you won't find in DxOMark?

DxOMark focuses only on image quality performance but does not cover many other criteria that are important when looking for cameras or lenses that fit your needs.

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Pentax K-5

16.30 Megapixels	PENTAX KAF2 (KAF2, KAF, KA)	3.0 inch LCD

Save Money!

Pentax K-5

No price data available. Check back soon.

Basic Specifications	
Resolution:	16.30 Megapixels
Kit Lens:	3.00x zoom 18-55mm (27-83mm eq.)
Viewfinder:	Optical / LCD
LCD Size:	3.0 inch
ISO:	80-51200
Shutter:	30-1/8000
Max Aperture:	3.5
Mem Type:	SD / SDHC / SDXC
Battery:	Custom LiIon
Dimensions:	5.2 x 3.8 x 2.9 in. (131 x 97 x 73 mm)
Weight:	26.1 oz (740 g) includes batteries
MSRP:	$1,750
Availability:	10/2010

Pentax K-5 Overview

Preview by Mike Tomkins
Posted: 9/20/2010

With a brand-new 16-megapixel sensor, seven frames per second burst rate, and an unusually wide expanded ISO sensitivity range of 80 to 51,200 equivalents, the Pentax K-5 takes over the flagship position in Pentax's APS-C digital SLR lineup, replacing last year's K-7 model. (Technically, the Pentax K-5 is the company's flagship digital camera in most markets, period, since the attention-grabbing medium format Pentax 645D model has very limited distribution outside of the Japanese market.)

While its nearly identical to its predecessor externally, the Pentax K-5 sports a number of under-the-skin improvements beyond those enabled by its updated CMOS image sensor, some of them seen previously in the recently-announced mid-range Pentax K-r DSLR.

The Pentax K-5 includes the latest generation of Pentax's SAFOX phase-detection autofocus module, which debuted in the 645D. The 11-point SAFOX IX+ module combines features of the SAFOX VIII+ module from the K-7, and the SAFOX IX module from the K-r. It should yield improved low-light focusing, as well as more accurate and stable AF overall.

The Pentax K-5 also inherits the dual-axis level gauge function from the 645D, giving an indication of both tilt and roll, where the K-7 offered only a single-axis roll gauge. Coupled with the sensor shift stabilization system from the K-7, which can correct for rotation around the lens barrel axis, the Pentax K-5 can also automatically correct for slightly tilted horizons at capture time.

Pentax has updated its high dynamic range mode in the K-5, enabling handheld HDR shooting, and providing a greater degree of control over the look of the HDR effect that can be achieved in-camera. Other creative additions include the latest Custom Image and Filter effects from the K-r, such as an overhauled Cross Process function, Bleach Bypass effect, and more.

Also updated is the Pentax K-5's movie recording function, which now captures videos at up to Full HD (1080p) resolution, and the K-5 still includes both an external stereo microphone jack, plus the ability to control the aperture used for video recording. For creative types, the Pentax K-5 now allows use of some of its filter effect functions during movie recording.

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Top 3 photos this month win:

First
Canon PIXMA Pro9000 Mark II

Second
Canon PIXMA MP990

Third
Canon PIXMA MP640

The Pentax K-5 uses SD and SDHC memory cards for storage, and a firmware update due shortly after the cameras ship will enable compatibility with SDXC cards as well. All accessories compatible with the K-7, including Pentax's battery / portrait grip, tethered and infrared remotes, and lithium ion battery pack, will also work in the Pentax K-5, making it rather easier for current K-7 owners to justify upgrading to the newer model.

Due to ship in October 2010, the Pentax K-5 comes body-only, or with a weather-sealed 18-55mm kit lens. Body-only pricing is set at around US$1,600, while the 18-55 WR kit will cost about US$1,750.

Pentax K-5 Preview

by Mike Tomkins

The Pentax K-5 refreshes the design of Pentax's previous flagship model, the K-7, with a number of important changes to key subsystems, while retaining much of its predecessor's DNA. As more of an incremental upgrade, the K-5 might not grab headlines for Pentax in quite the same way that the K-7 was able to do -- that camera, after all, marked a significant step forward with a brand-new body, viewfinder, LCD, image sensor, image processor, and metering system, plus updates to the company's autofocus, stabilization, and dust reduction systems, and plenty of other changes throughout. It also heralded the arrival of some truly unusual capabilities, including in-camera HDR, a self-leveling sensor, high-def video capture with aperture control and stereo mic jack, and more besides.

By comparison, the Pentax K-5 takes many of the K-7's best features with small tweaks as needed to improve usability, and focuses on improving performance in a number of specific areas. Key among these are a new image sensor, a refined phase detection autofocus module, improved burst-shooting speed, greatly expanded ISO sensitivity range, and improved high-def movie capture.

Externally, the Pentax K-5 is nearly identical to its predecessor, with just a couple of subtle refinements to controls, including a slightly taller Mode dial, and a Focus Mode switch that's now easier to adjust. Body weight has also been reduced by around ten grams, likely due to the change of image sensor, and the onboard A/D conversion negating the need for some extra components. The Pentax K-5 still includes the rear-facing IR port for shake-free shutter control.

In other respects, the Pentax K-5's rugged, weather-sealed, magnesium alloy body is indistinguishable from that of its predecessor without looking at the model number -- and that's a good thing, because it's a design with that we quickly fell in love with when we reviewed the K-7 a little over a year ago.

One of our favorite features on the K-7 was the RAW button, which drops you into RAW capture mode for one shot, or can be made to act as a toggle between RAW and RAW+JPEG capture. If that's not of interest to you, though, you can convert this button into a Function (Fx) button, activating your choice of Exposure bracketing, Digital preview, Electronic level, and Composition correction.

Sensor. The Pentax K-5 is based around a new 16.3 effective megapixel, APS-C sized (23.7 x 15.7mm), RGB CMOS image sensor, with a total resolution of 16.95 megapixels. The new chip increases linear resolution by a modest 5%, as compared to the 14.6 effective megapixel CMOS sensor that was featured in the K-7. It also has ever so slightly larger surface area, versus the previous 23.4 x 15.6mm chip. The new sensor design features on-chip analog-to-digital conversion, which has helped Pentax to reduce noise levels across the board.

The Pentax K-5 offers a maximum image resolution of 4,928 x 3,264 pixels, in place of the K-7's maximum size of 4,672 x 3,104 pixels. Three lower-resolution options are also available, all unchanged from the K-7 -- 3,936 x 2,624, 3,072 x 2,048, and 1,728 x 1,152 pixels.

Processor. Output from the Pentax K-5's new image sensor is processed by the same PRIME II (PENTAX Real Image Engine II) imaging engine that's previously been featured in the K-7, K-x, and K-r, but the combination offers significant improvements over the K-7 in terms of both sensitivity and burst speed. When it came to high ISO shooting, the K-7 was little changed from Pentax's earlier K20D model, with a standard sensitivity range of ISO 100 to 3,200 equivalents, which could be expanded to reach as high as ISO 6,400 equivalent. The Pentax K-5 provides a significantly wider standard range of ISO 100 to 12,800 equivalents, adjustable in 1/2, 1/2 or 1EV steps. The expanded range goes even further, providing everything from an ISO 80-equivalent minimum to a maximum of ISO 51,200 equivalent.

An interesting feature of the Pentax K-5 is that noise reduction settings can be specified on a per-ISO basis. That is to say, you could for example set one specific ISO sensitivity to use higher noise reduction than those surrounding it, and as you switch between those sensitivities in future, the camera will remember those preferences. This provides a nice level of user control over the tradeoff between noise levels and subject detail across the sensitivity range.

There are a couple of provisos related to Bulb-mode exposures worth noting. For one thing, they're limited to a maximum of ISO 1,600 equivalent. We also understand that bulb mode likely still requires use of dark frame noise subtraction on exposures over 30 seconds in length.

Burst speed. The improvement in burst speed, while perhaps not as big a step forward as that made in terms of sensitivity, is still very worthwhile -- but unfortunately it does come accompanied by a reduction in burst depth. Pentax's previous flagship model, the K-7, offered a maximum of 5.2 frames per second, a figure that was bested a couple of weeks ago with Pentax's announcement that the new mid-range K-r model would offer a class-leading six frames per second. The Pentax K-5 now returns the frame rate crown to the company's new flagship model, with a maximum rate of 7.0 frames per second on offer -- more than one-third faster than the K-7.

At 22 full-resolution Best-quality JPEG frames, the Pentax K5's maximum burst depth has dropped significantly from the K-7's 40 frame limit, and indeed, doesn't quite match the 25-frame limit of the mid-range K-r model. This reduction in depth likely comes as a side effect of the K-5's increased resolution. For raw shooters, the reduction is even more significant, with the Pentax K-5 limited to just 8 raw frames in a Continuous Hi burst -- four less than the K-r, and barely more than half the 15-frame burst depth of the K-7. The harsher penalty in raw shooting is probably further caused by a switch to 14-bit raw files, versus the smaller 12-bit raws created by earlier Pentax DSLRs.

For subjects where a little less speed is required, the K-5's Continuous Lo mode captures Best-quality JPEG images at two frames per second for as long as there's available card space, and can manage 12 Raw frames in a burst. This reduced rate is significantly slower than the 3.3 frames-per-second Continuous Lo burst shooting available in the K-7, and yet is still accompanied by a fair reduction in raw-format burst depth from the K-7's 17 raw frames.

Shake Reduction. Pentax has retained the K-7's in-body stabilization system for its follow-up camera. The K-5's image sensor assembly is mounted on a ball-bearing supported moveable platter, allowing for sensor-shift image stabilization -- which Pentax brands Shake Reduction -- compatible with all Pentax interchangeable lenses produced to date. The Pentax K-5 shares the K-7's unique ability to correct not only for horizontal and vertical motion, but also for rotation around the axis of the lens barrel. One degree of rotational correction on either side of the central position is possible, and Pentax is claiming 2.5 to 4 stops of correction can be derived from its sensor shift system. (Though we'd earlier reported that rotational correction was a feature of Shake Reduction back to the K100D, Pentax later informed us that this was a misunderstanding resulting from a translation error back in 2006).

The drawback to Pentax's Shake Reduction technology is that you can't see its effects as you look through the optical viewfinder, as you can with Canon and Nikon's lens-based stabilization systems. But thanks to the Pentax K5's Live View mode, you can indeed see the effect on the LCD, and SR seems to be pretty solid and effective.

Dust removal. The Pentax K-5 also includes Pentax's DR II dust removal system, which has previously featured in the K-7 and 645D models. Where other Pentax DSLRs rely on the sensor shift mechanism to remove dust from the sensor -- rather ineffectively according to our tests -- the K-5's DR II system includes a piezo-ceramic element to vibrate the low-pass filter. A dust alert system can check for the presence of dust on the low-pass filter, at the user's prompting.

Lens mount. On its front panel, the Pentax K-5 features a K_{AF2} Lens mount, which is also compatible with K_{AF3}, K_{AF}, and K_A mount lenses. Both in-body and in-lens AF mechanisms are supported, as is power zoom with compatible lenses. Pentax K mount lenses can also be attached, as can 35mm screwmount and 645/67 medium format lenses using optional adapters, although there may be restrictions depending on the lens type used.

Lens distortion correction. The Pentax K-5 can correct for lens distortion and lateral chromatic aberration in-camera when using DA and DFA lenses, as well as several of the company's FA Limited lenses. It's a feature that was fairly unusual when the previous K-7 model was introduced, but which is gradually becoming more commonplace. When enabled, these corrections do have a significant negative impact on burst shooting speed.

Autofocus. Pentax has also upgraded the K-5's autofocus system to its latest SAFOX IX-series module, a designation which has only previously been applied to the company's medium format 645D and K-r models. Compared to the previous-generation SAFOX VIII+ system used in the K-7, SAFOX IX+ has the same point count and arrangement, but several important differences. There are a total of eleven points, of which all but two are cross-type, sensitive to both horizontal and vertical detail. The cross-type points are arranged in a three by three grid towards the center of the image frame, while on either side of this grid there's one linear sensor.

The SAFOX IX+ AF module's optics have improved transparency, which should translate to improved performance in low light. The AF module's optics also have better controlled aberration, improving autofocus accuracy. Ambient temperature should also have less of an impact on the SAFOX IX+ module. Sharp-eyed readers will note that the K-5's SAFOX module adds the "+" designation, which has only previously been featured in the 645D and K-7. This hints at one important feature that's included in the prosumer K-5, but not the mid-range K-r. Like the K-7 and 645D models before it, the Pentax K-5's AF system includes a secondary light color sensor dedicated to determining the light source type, which is then taken into account when determining focus, a capability the K-5's more affordable sibling lacks.

Beyond the change of phase detection module, Pentax has made several other important changes to autofocus in the K-5. The K-7's somewhat fiddly focus mode selection dial has been redesigned, and should be easier to adjust without removing your eye from the viewfinder. Pentax has also incorporated the 5-point selection mode from the K-x and K-r models, which mirrors the point arrangement of earlier models such as the K2000 / K-m. Perhaps most importantly, though, Pentax has added the ability to select the priority for single and continuous focus modes. For single AF, K-5 users can opt for either focus priority, which mirrors the K-7's behaviour in requiring an AF lock before the shutter can fire, or shutter-release priority, which starts exposure immediately that the shutter button is fully depressed, even if an AF lock hasn't been achieved. In continuous AF mode, the options are focus priority, or frame rate priority. The former requires an AF lock for each individual frame in the burst, while the latter replicates the K-7's behaviour by emphasising frame rate for each shot in the burst, even if this means a lock can't be achieved for individual frames in the burst.

Metering. Automatic exposure is achieved courtesy of the same 77-segment metering sensor that debuted in the K-7, replacing Pentax's previous 16-segment metering system. Options include Matrix, Center-weighted, and Spot metering, selectable via the switch beneath the Mode dial. A full 5.0EV of exposure compensation is available in either 1/3 or 1/2EV steps.

Exposure Modes. Exposure modes in the Pentax K-7 include Green (fully automatic), Manual, Bulb, Shutter- and Aperture-priority, and a Hyper Program mode which allows shutter and aperture to be simultaneously adjusted around a predetermined Program exposure. There's also Sensitivity Priority, plus Shutter-and-Aperture Priority where the user defines both shutter speed and aperture, and the camera selects an appropriate sensitivity. Finally, a User mode allows settings to be saved for later reuse -- and this has been updated from that in the Pentax K-7. Where previously only one group of settings could be saved, the K-5 will now allow five different settings groups to

be notd for future recall. Since there's still only one User position on the Mode dial, the choice of which user preset to apply is made through the K-5's menu system.

Drive Modes. In addition to the previously described 7 frames-per-second Continuous Hi and 2 fps Continuous Lo modes, the Pentax K-5 offers a variety of other drive mode options. These include the ability to bracket multiple exposures with anywhere up to 2.0 EV between each exposure, set in 1/3 or 1/2 EV steps. Where the K-7 allowed either 3 or 5 exposures in each bracketed sequence, the K-5 now also allows two-frame bracketed exposures. The Pentax K-5 also includes a 2 and 12-second self-timer, with self-timer indicator LEDs provided on both the front and back of the camera. Several remote control modes, taking advantage of the optional cabled or infrared remote units. These include standard remote shooting, remote with a three-second delay, and continuous burst remote capture. To prevent vibration issues in long exposures, the Pentax K5 further offers a mirror lockup function that also functions during continuous shooting in Live View mode.

Shutter. Like that in the K-7, the Pentax K-5's shutter unit is capable of a maximum 1/8,000 second shutter speed, and has a rated lifetime of 100,000 cycles. Minimum shutter speed is 30 seconds, and a Bulb position is also available. Note, though, that Bulb exposures are limited to ISO 1,600 max.

White balance. The K-5 offers a wide range of white balance settings: as well as Automatic and Manual modes, there are no less than ten white balance presets (Daylight, Shade, Cloudy, Daylight Color Fluorescent, Daylight White Fluorescent, Cool White Fluorescent, Warm White Fluorescent, Tungsten, Flash, and Color Temperature Enhancement). This last option is used to retain and enhance the lighting tone - for example, to enhance a sunset. Finally, white balance can be measured from a neutral target, either by capturing a new image, or selecting an existing one on the K-5's flash card, and three specific color temperatures can also be manually stored in-camera for later recall.

Flash. As well as a hot shoe and PC socket for external flash and studio lighting connection, the Pentax K-5 includes a built-in popup flash. Rated at 13 meters / ISO 100, the K-5's onboard flash is unchanged from that of the K-7, and offers 28mm coverage plus red-eye removal capability. The K-5 still has X-sync at 1/180 second, offers -2 to +1EV of flash exposure compensation, and can offer both first- and second-curtain flash.

Viewfinder. Pentax has retained the K-7's glass prism-type TTL optical viewfinder unchanged for its new flagship Pentax K-5 model. This viewfinder offers a 100% field of view and 0.92x magnification. Four interchangeable focusing screens are available, with the default being the same Natural-Bright-Matte III screen that came bundled with the K-7. The K5's viewfinder offers -2.5 to +1.5 diopter adjustment to cater for eyeglass wearers, and has an eyepoint of 21.7mm from the eyepiece frame, or 24.5mm from the exit pupil.

LCD. Also carried over unchanged from the K-7's design is the Pentax K5's 3.0-inch LCD display, which offers 921,000 dots of resolution. This equates to roughly 640 x 480 pixels, with each pixel comprising adjacent red, green, and blue dots. The display is an in-plane switching TFT type, which offers wide 170 degree horizontal and vertical viewing angles, and includes an anti-reflective coating. Depth-of-field preview is possible in both the optical viewfinder and on the LCD display.

Live View. The Pentax K-5's live view mode is little-changed from that of the K-7. It offers a choice of either contrast detection AF or phase detection AF, and provides face detection capable of recognizing up to 16 individual faces in a scene when using the former. When in live view mode, the display can be magnified from two to six times if using autofocus, up to a maximum of 10x magnification in manual focus mode. Optional histogram and over / underexposure highlight displays are also available in live view mode. There's also a choice of three grid overlays, two more than in the K-7. Additional grid displays in the Pentax K-5's live view mode include a scale display, and a golden section overlay, useful for precise image alignment.

Movie mode. The Pentax K-5 has several changes to its Movie mode, compared to the K-7. The previous model's non-standard high-definition resolution of 1,536 x 1,024 pixels has been replaced by a standard 1,920 x 1,080 pixel, 25 frames-per-second mode, commonly known as "Full HD" or "1080p". The K-7's alternate 720p (1,280 x 720 pixel) high-def mode is retained, while the non-standard 640 x 416 pixel mode has been replaced with a standard-def VGA (640 x 480 pixel) mode. The 720p and VGA modes both offer a choice of either 25 or 30 frames per second recording. All three types are recorded using Motion JPEG compression, in an AVI container. Maximum clip length is 25 minutes or 4GB, whichever limit is reached first. Like competing DSLRs, the Pentax K-5 also monitors sensor temperature during recording, and will halt capture if the temperature rises beyond a certain threshold.

Like that in the Pentax K-7, the K-5's movie mode doesn't offer autofocus during movie recording. It also lacks manual control of movie exposure, offering only a choice of Program or Aperture-priority exposure modes for movie shooting. It does, however, allow exposure compensation and autoexposure lock, which can be used together with aperture-priority mode to provide some control over the look of videos. The ultimate decision as regards frame rate and ISO sensitivity is always left in the camera's hands, though. Note that in Aperture-priority movie shooting, the aperture is fixed from the start of video recording. Movie audio is recorded either from an internal monaural microphone, or from an external mic via a 3.5mm stereo jack. As with the K-7, the Pentax K-5 offers no manual control over audio levels during recording. Audio capture can, if desired, be disabled altogether.

Like the recently-announced K-r, the Pentax K-5 also now allows use of some of the company's various filter functions when recording movies, including Cross Processing, Toy Camera, Retro, High-Contrast, Extract Color, and Color. We don't currently have details as to which of the filters adversely affect frame rate, but understand this may be the case with certain filters -- not surprisingly, as this is something we've previously noted in some rival

cameras, such as Olympus' PEN series single-lens direct view models.

The Pentax K-5 also includes limited in-camera movie editing functionality, something that wasn't present in the K-7 at launch, but was recently made available via a firmware update. It's possible to specify start or end points in a video clip, and then split the file at those points, providing the ability to record for a little longer than necessary so as to be sure you don't miss the action, without then wasting valuable storage space storing the unwanted portions of the video. This is perhaps more important for the K-5 than some competing cameras, given its choice of the relatively less space-efficient Motion JPEG compression.

Dual-axis level gauge. The Pentax K-5's leveling sensor is upgraded from that in the K-7, and matches the capabilities of the medium format Pentax 645D. Instead of the K-7's single-axis roll sensor, the K-5 sports dual-axis roll and tilt sensors, enabling the camera to be leveled on both axes. Like the K-7, the K-5 can display the roll level on both the viewfinder and top panel status displays, as well as the rear LCD panel. Tilt level can only be displayed on the rear panel.

Composition correction. One of the more unusual features of the K-7 is retained for the Pentax K-5, and relies on its sensor-shift image stabilization mechanism. When shooting on a tripod, it is possible to fine-tune your framing by manually controlling the position and rotation of the image sensor. A total of two degrees rotation and three millimeters of horizontal or vertical adjustment (one degree and 1.5mm on either side of the centered position) are available. If the sensor is tilted, the available horizontal / vertical adjustment range may be reduced by as much as 1mm on either side of the centered position, potentially restricting the adjustment range to 2mm total on either axis.

Self-leveling function. Also thanks to the sensor-shift mechanism and internal roll sensor, the K-5 also offers an electronic level function that actually rotates the sensor to a level position when enabled, correcting for errors of one degree in either direction. Like the K7 before it, the Pentax K5 performs this unique trick whether framing portrait or landscape-orientation shots, although the function is automatically disabled if the camera is tilted forwards / backwards beyond a certain threshold.

Connectivity. Interface options in the Pentax K-5 are unchanged since the K-7, and include high definition mini-HDMI video output, standard definition NTSC / PAL switchable composite video output, and USB 2.0 high speed data connectivity. Unfortunately, like the K-7 before it, the Pentax K-5 lacks tethered shooting capability, a feature that was present on the company's earlier flagship models. There's also an 8.3 volt DC input, a terminal for the wired CS-205 cable release, a PC sync terminal for external flash strobes, a 3.5mm stereo microphone jack for recording movie audio from an external microphone, and a proprietary contact on the camera's base for an optional battery / portrait grip. The Pentax K-5 also includes two infrared remote receivers -- one each on the front and rear of the camera body, allowing for the shutter to be released wirelessly from most angles, using the optional Remote Control F, or the waterproof O-RC1 remote.

Power. The Pentax K-5 accepts the exact same D-LI90 lithium ion battery pack as its predecessor, the K-7. The D-LI90 is a 7.2V pack rated at 1,860 mAh / 14Wh. Battery life is rated at 980 shots without flash usage, 740 shots with 50% flash usage, or 440 minutes of playback on a charge -- unchanged from the figures for the K-7 despite the increased resolution and burst rate. For studio shooting, or while offloading data via USB, the K-5 can also draw power from Pentax's K-AC50 AC adapter.

Battery grip. The D-BG4 battery grip for the Pentax K5 is the same model compatible with the K7, and comes with two trays -- one for six AA batteries, and one for a single D-LI90 battery. The K5's battery grip transfers power through a dedicated, proprietary connection, so you can leave a battery in the camera to double the battery life, and needn't fiddle to remove the battery door, as in some competing designs that use a dummy battery. While this design is nice because you don't have to worry about the cumbersome tower that goes up into the battery compartments of other camera designs, you will have to remove the entire grip to change the K7's internal battery. (Of course, you can leave the internal battery compartment empty, and simply place your battery pack in the portrait grip, so this is of little import in real-world use unless you intend to use both battery bays simultaneously.)

The D-BG4 is weather sealed like the camera body, and duplicates several controls from the camera's main interface, including the shutter release, front and rear e-dials, the AE-Lock, and the AF button. It also includes an insert in which to store the protective caps from the body and grip terminals when in use, and the lithum ion battery tray further includes space to store a spare SD card inside the grip. (Sadly, it lacks the space from Pentax's earlier grips in which the tiny Remote Control F could be stored.)

Storage. Similarly to the recently-announced K-r, the Pentax K-5 supports not only Secure Digital and SDHC memory cards, but will also support the latest generation SDXC cards. Although their speed is unchanged, SDXC cards are already available in significantly higher capacities than their other SD brethren. We understand that the Pentax K-5 won't support SDXC cards at launch, but that this capability will follow in a firmware update at some point after the camera is commercially available, providing a level of future proofing in terms of media support. Use of SDHC Class 6 or higher cards is recommended for video capture or shooting high-speed still image bursts. Lower-speed cards can be used, but may reduce the movie clip length or still image buffer depth.

Although dual media slots are becoming somewhat more common these days, the Pentax K-5 only has a single card slot, like its predecessor. One other storage-related change is that the Pentax K-5 now uses 14-bit raw files for both Adobe DNG and Pentax PEF raw formats, rather than the 12-bit files of previous Pentax digital SLRs.

Helpfully, given the lack of tethered shooting capability in the K-5, we understand that it does support Eye-Fi's WiFi-capable Secure Digital cards. While not as fast as a USB 2.0 tether, the feature does at least provide a means

to get data off the camera in studio shooting without having to repeatedly swap cards around. Unlike Pentax's current compact cameras, the K-5 isn't an Eye-Fi Connected device, and so doesn't provide the ability to adjust card settings, etc. in-camera. Instead, setup must be done first on your computer -- but once that's been done, the K-5 can transmit JPEG and raw data wirelessly to your PC, either with a backup on the Eye-Fi card, or deleting data from the card when it's been successfully transmitted.

Custom image modes. The majority of other differences between the Pentax K-5 and its predecessor are also found in its firmware functionality. Pentax has added an additional custom image mode to the existing eight found in the latest K-7 firmware, emulating the look of Bleach Bypass images. Even if you've not previously heard the term, it's likely you're familiar with the effect, as bleach bypass has been a popular effect in the movie industry for many years. With film, the effect was achieved by skipping or abbreviating the bleaching stage of processing, leaving some silver in the emulsion alongside the color dyes. The effect is a grainy, high-contrast look with reduced saturation and exposure latitude.

Filters. There are also two new Playback-mode filter functions not found in the K-7, both of which debuted in the recent K-r, and whose effects are self-explanatory. The sketch filter mimics the look of a hand-drawn image, while the posterization filter causes abrupt transitions in tone. The color extraction filter has also been updated, and now allows two color ranges to be highlighted in an image, with colors outside these ranges desaturated.

Cross Process. The Pentax K-5 also inherits an updated version of the cross-process function that debuted in the K-x, which is intended to offer a similar effect to the film processing technique. Cross processing of film involves intentionally using processing chemicals with a film type for which they weren't intended, with unpredictable but sometimes eyecatching effect. In the K-x, the function -- accessed through its own option in the record menu, rather than as a filter or custom image mode -- could only be switched on and off, and yielded a random effect that couldn't be previewed ahead of time. In the Pentax K-5, it's still possible to use the cross process function in this manner, but there are also three preset cross process modes that offer a consistent look from shot to shot. In addition, there's an adjustable user favorite preset, which allows the look to be tailored to the photographer's needs.

HDR. The Pentax K-5 also updates the high dynamic range function that debuted in the K-7, and was retained for the K-x. HDR photography allows capture of images with greater dynamic range than the sensor is capable of detecting, by taking multiple images with varied exposure, and then combining them to produce a single shot with increased dynamic range. Since it involves multiple exposures, it's only useful for relatively static subjects. At the time of the K-7's launch, the feature was unique in the digital SLR market, but it's since been mirrored -- and improved upon -- by rivals.

As in the recent K-r announcement, the K-5's HDR function includes several changes. The most significant of these is that the K-r now microaligns images before combining them, making it possible to shoot handheld HDRs. (Previously, even a slight camera movement would cause artifacts throughout the image, rendering it unusable -- and hence HDR mode was limited to tripod use.) The K-5 now has Auto, Standard, and three Strong effect modes, providing further control over the look of the HDR effect applied.

Time-lapse. Pentax has retained the time lapse mode from the K-7, and the camera can also shoot multiple exposures with an overlay of the previous image on the LCD to assist in alignment.

Copyright. Another K-7 feature retained for the K-5 allows you to specify a copyright holder for storage in the EXIF header of photographs. This is entered via the camera's menu system, rather than setting this via an attached computer.

Software. The Pentax K-5 ships with a newer version of Pentax's software CD than that included with the K-7. Where the previous model included the S-SW90 CD, the K-5 now ships with the S-SW110 disc. The actual software bundle is unchanged, and still includes Pentax's Silkypix-derived Digital Camera Utility 4 package. The newer version of the CD simply includes more current versions of the software with support for the latest Pentax DSLR bodies and lenses

Pricing for the Pentax K-5 is set at approximately US$1,600 for the camera body alone, with availability expected from October 2010. In addition, a kit bundle with the 18-55mm WR lens will also be available, priced at about US$1,750.

New lens. Alongside the launch of the camera, Pentax has also announced another new WR lens, bringing the total number of the company's weather-resistant consumer lenses to four models. The smc PENTAX-DA18-135mm F3.5-5.6 ED AL [IF] DC WR lens has a built-in Direct Current autofocus motor, and a focus ring that doesn't move during AF operation. Pricing for this lens is set at US$530, and it will be available from October 2010.

In addition to its WR lens models, note that all six lenses in Pentax's current DA * lineup are weather-sealed. This means that K-5 owners have a total of ten lenses from which to choose, all including weather sealing matching that of their camera body. (Of course, in most conditions you can also use non-sealed lenses with the K-5 body, but these could potentially allow dust and water to enter the camera body if used in adverse conditions.).