Canon EOS R

A field review

(web: www.actionimage.co.za email: simondp@actionimage.co.za)

INTRODUCTION AND BACKGROUND

The Canon EOS R is the beginning of a new era for Canon, being the first full frame Mirrorless digital camera produced by the company using their new RF lens mount system.

A lens mount adapter, of which three different models are offered, is supplied to make the RF mount compatible with the current huge range of Canon EF and EF-S lenses. This EF/EF-S to RF adapter was provided boxed with the camera. My initial thoughts was how compatible this will really make these lenses to the RF mount, as the EF to EF-M adapter used with the likes of the Canon EOS M5 didn't allow for full functionality of the camera. More on this new adapter later in the review.

I do my reviews in the way a camera is likely to be used; out in the field, real life conditions with real life subjects. There are enough intelligent guys out there for the lab tests and DXO charts etc, What I present is how the camera fared under certain conditions using typical lenses. If a parameter does not work for me, it does not mean it won't work for someone else. We all have our own requirements and preferences when choosing camera equipment.

Initially, after the first week or so with the EOS R in my hands, I felt a little disappointed with the results I was getting, clearly there must be more to be had from this little camera. Internet searches showed quite a lot of negativity towards this camera, apparently ignoring the fact that it is more about the new lens mount system, and the EOS R is merely the first body to use this RF lens mount.

A visit to Roger Machin, Canon SA Product Manager yielded a lot of general and technical info on the new RF lens mount system and how it functions in the EOS R body. Also why Canon was "compelled" to design a new lens mount. In a nutshell the older EF and EF-S lens mount have reached its pinnacle in design, data handling between camera and lens, and optical design around the lens. Very fast wide angle lens design with superior optical quality just wasn't possible with the old design, it could be done, but not with the desired optical quality and potential that could be had from this type of lens whilst keeping it affordable for the man on the street who has to pay for all this technology.

Data handling, along with technology advances in the wonderful world of computer technology, required and made possible a faster data transfer rate between lens and camera body, the RF mount using 12 contact pins instead of the eight found with the EF lens mount, massively increasing the data transfer rate.

The RF lens mount retains the same 54mm inner diameter of the EF mount but the flange back distance (the distance from the back of the lens mount to the sensor) is now 20mm instead of the 44 mm on the EF lens mount. This was possible by getting rid of the flip-up mirror assembly, which also meant there can be no Through The Lens (TTL) optical viewfinder, hence the Electronic View Finder (EVF) found on the EOS R and now RP camera bodies.

SPECIFICATIONS

The EOS R uses the same 30.3 MP full frame CMOS sensor which is also found in the Canon EOS 5D Mk IV D-SLR, and is also integrated with Canon's Dual Pixel CMOS Auto Focus (AF) system, which is proven to work quite well indeed.

The important specifications are listed below:

Sensor	30.3 MP CMOS	Same as EOS 5D Mk IV
Sensor size	36mm x 24mm	Full frame
Resolution	6720 x 4480 pixels	
Processor	Digic 8	
ISO range	100 – 40,000	Extended range 50 – 51,200
Viewfinder:	3.69 Million Dot OLED Electronic Viewfinder (EVF)	100 % coverage, 0.76x magnification
Frame rate	8 fps (One shot mode only)	5 fps AI Servo and EVF, 3 fps AI Servo and live view.
Shutter speed range	30 sec – 1/8000	
Autofocus System	Dual Pixel CMOS AF (approx. 60MB raw file size)	5655 Focus points
Body	Weather sealed, Magnesium Alloy build	
LCD Screen	Touch-enabled 3.2″ Fully Articulating LCD	2.1 million dots
Weight	660 g	
Size	136 x 98 x 84 mm	W x H x D
Storage	1 x SD/SDHC/SDXC slot	
Battery	LP E6N	Claimed 350 shot life (CIPA standard).
Video mode	4K UHD @ 30 fps	Also slow motion HD video
Video Compression	H.264/MPEG-4 Advanced Video Coding	
HDMI Output	10 bit, 4:2:2	

Notably absent are an integrated pop-up flash, GPS, AF fine-tuning per lens, intervalometer and no focus stacking.

Included are built-in Dual Pixel AF at almost double the raw file size, Wi-Fi, Bluetooth, silent shutter mode and in-camera HDR capability

The full set of specifications can be seen at the Canon website using the following link:

https://www.canon.co.za/cameras/eos-r/specifications/

UNBOXING

The Canon EOS R comes securely packed in the typical black Canon outer package with body and standard accessories securely packed inside in two compartments, a plastic type tray separating the two compartments.

In the box are the camera body, lens adaptor, neck strap, battery and battery charger with power cord and a 3.1 USB – C connector cable. A quick start manual and the usual warranty card are also included.

Putting it all together is easy enough, no fancy stuff and anyone who has handled a Canon camera before should accomplish this easily enough. You can always revert to the quick start manual if required.

MENU LAYOUT

The basic menu layout follows the now familiar Canon grouping of menu items, easily understandable and the set-up function is nicely intuitive. The Help info is also available at the touch of a button should it be required.

Special notes on set-up and settings:

The MODE button allows the setting of the shooting mode: Fv, P, Tv, Av, M, B, C1p C2p, C3p

A^+	Scene Intelligent Auto	Fully automatic mode – camera analyses scene and sets optimum settings automatically
Fv	Flexible-priority AE	User can set shutter speed, aperture and ISO speed manually or automatically, much the same as in P, Tv, Av, or M modes
P	Program AE	The camera will automatically set the shutter speed and aperture for optimum exposure.
Tv	Shutter-priority AE	User sets desired shutter speed, and camera will set an aperture value for balanced exposure
Av	Aperture-priority AE	User sets desired aperture value, and camera will set a shutter speed for balanced exposure
M	Manual	User sets both shutter speed and aperture values, and ensures through reading of exposure meter if proper exposure will be possible under the prevalent conditions.
B	Bulb	Shutter stays open for as long as shutter button is depressed
C1p	Custom 1	
C2p	Custom 2	
C3p	Custom 3	

A read through the full manual downloaded from Canon website revealed little surprises, newer settings like Touch AF, in-camera cropping, the selection and set-up of the AF zones and AF point selection will require some reading of the manual to fully understand how it works and what it will do for the user. Similarly the fine-tuning of the camera's Custom Functions will demand attention from the user.

The Eye-detect AF function is quite a nifty feature and should be advantageous to the people photographers; wedding, portfolio and the like. Activating this in conjunction with AI Servo (required for optimal use) will let the camera pick out the eyes of the subject and keep the focus points on them irrespective of how the subject turns and tilts his head. Using Roger Machin as a subject I kept 9 of ten shots right on the eyes with him moving his head sideways, forward and backwards, up and down, circular motion….the EOS R kept delivering the results. Three differently-posed samples are presented below, just cropped and resized in Canon's Digital Photo Professional software (DPP).

Canon EOS R, Canon RF 85mm f1.2 L USM, 1/2000, f1.2, ISO 3200, natural lighting

Just have to mention – that RF 85mm f1.2 L USM is one of THE sharpest lenses I've ever used!

Mount Adapter EF-EOS R

Canon has the EF/EF-S to RF lens mount adapter available in three different models (info from the Canon website):

- The standard Mount Adapter EF-EOS R allows EF-S and EF lenses to be used on EOS R cameras – this is a plain adapter with the only functionality of mounting the different lens mounts to the RF mount.
- Control Ring Mount Adapter EF-EOS R offers the same lens mount conversion as Mount Adapter EF-EOS R, but also adds a Lens Control Ring which is customisable and can easily be used without taking the camera from your eye.
- Drop-In Filter Mount Adapter EF-EOS R takes the functionality of Mount Adapter EF-EOS R and adds the ability to use drop-in filters, removing the need to fit filters on the front of a lens, especially useful for wide-angles with a large front lens element. It's available with either a variable neutral density (V-ND) filter[2] or circular polarising (C-PL) filter, and a clear (CL) filter is also available for shooting without filter effects.

My test camera was supplied with the standard lens mount adapter.

IN THE FIELD PERFORMANCE

What I liked about the camera was its light weight. It's easy to use even with a very basic understanding of the icons, buttons and menus and anyone who has owned a Canon D-SLR camera in recent years will find themselves in familiar territory.

This is one of those cameras that "grow" on you. There was a lot that I didn't like initially on this camera, but which you get used to, learn to accept and adapt to the longer one play with this little camera. I personally didn't like the feel of the body in my hand. Then again, I am not exactly small and have been issued with gorilla hands, so the quite small EOS R didn't feel very comfortable in my hand, but neither do any of the small EOS 700/750/800D type bodies. The smaller bodies do not offer good support to the palm of my hand and support for my little finger, but the grip is deep enough on the front face to support my fingers when holding the camera, with the fingertips not pressing to hard against the body. It does feel better with the optional battery grip attached, but I still prefer the heft and feel of my 1D series bodies. My rather petite niece didn't mind the smaller body, she being used to her EOS 60D, and finding my 1D's a little heavy and cumbersome. Personal preference will play a role here.

Another thing I didn't like was the placement of the AF-On button on the back for the very handy back-button-focus technique. It doesn't fall naturally under the thumb of the right hand, and I continually missed it a number of times performing focus actions during the review period, from stills and macro through to the fast paced action shoots. Those new to the camera and with smaller hands might not have the same experience, learning the motor control from new, and not like me with 35 years of film SLR / D-SLR experience which has formed my hand coordination in a certain way.

Initially I didn't have any RF mount lenses on hand for this review, but did have Canon and third party EF lenses, and knowing many users will have similar lenses available, started off by testing their functionality on the EOS R using the lens mount adapter supplied with the camera.

One thing that immediately became apparent is that my eyes don't like the EVF functionality, I struggle a little to see finer detail sufficiently to determine if accurate focus was achieved, having to rely on the camera and its Beep sound in One-Shot AF for that. A zoom-in function on the EVF or live view does help, but this is only available in MF and One Shot AF. To activate this function you need to press two buttons on the back in quick succession which then provides a 5x or 10x magnified view of the subject (see user manual for detail). Best used for subjects that won't move off in the near future, and handy for certain macro applications. Any camera shake is also magnified 5x or 10x, so very steady hands or preferable stable support is recommended. The refresh rate of the EVF was also bothersome, too slow for anything moving faster than a snail – a slight exaggeration but a reality. More on this later.

As a stills camera it works really well, the very good top-line sensor performing as it should. Colour and clarity, detail etc are really good, noise kept to acceptable levels below ISO 3200, and even usable up to 6400 with some careful noise reduction applied in Canon's DPP (you'll need version 4.10.20.1 to read the .CR3 raw files from EOS R).

Using it for an outdoor family shoot the results were more than good enough, the very good sensor capturing pleasing skin tones and detail with the Canon EF 24-105 f4 L IS lens attached, with fill flash provided by my EX 430 MkII flash.

The very good noise handling capabilities of this camera will make it an ideal portrait / wedding camera with the outstanding (for me) video capabilities an added bonus.

Admittedly I didn't fully test the video functions of this camera, there are more very capable than me videographers out there who has already done that and reported in their reviews on this. The little I played with the video recording function actually surprised me, easy to use for the novice and the

more professional user will certainly like it. Results were impressive for me, good picture quality, large file sizes, but I assume video guys are already used to this.

Canon EOS R, Canon EF 24-105 f4 L IS @ 105mm, 1/200, f5.6, ISO 1250, fill flash

I compared the digital noise at ISO 6400 between three cameras, using the exact same settings, lens and raw development for all three, on a subject in a dimly lit environment, a quite severe test. First my Canon EOS 1D MkIV showed the noise levels I came to know from this body, just too much for acceptable levels with higher quality output, the EOS R with surprisingly good noise control and almost at the same level as my 1DX in the shadowy areas. Good performance then overall from the EOS R.

One should however take note of the battery status, using the live view a lot can seriously shorten the available battery use time. The CIPS standard test yielded a result of 350 exposures; my continued AI Servo tracking and shooting short bursts through the various phases of this review had the battery

almost flat within 230 shots. A spare battery on hand seems to be a good idea, fortunately I had one available. I ended up keeping the rear LCD closed to save battery live, using only the EVF.

Taking the camera to a classic car show also proved it's usability for this almost journalistic application, or stock photography. The exposure under varying lighting conditions was handled very well indeed, accurately capturing anything from appliance white cars in full frame or zooming in on small bonnet ornaments. Light and easily carried around even with the rather bulky Canon EF 24-105 mm f4 L IS lens used.

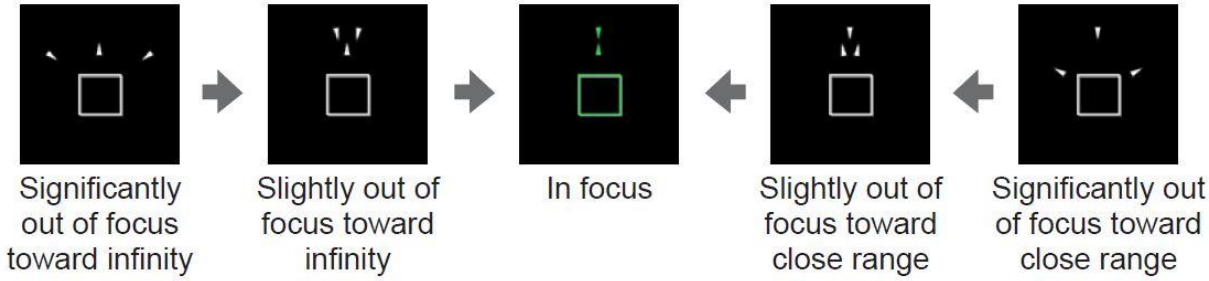
Using Live View in bright sunlight can make it a little more difficult to see the scene being composed, but a slight tilt of the articulating LCD screen to reduce glare from the direct sun does help with this, or allowing your own shadow to fall across the screen. As a traditionalist, I ended up using the EVF more than live view.

An important setting to remember is that pressing the "Delete" button when attempting to focus, will return the AF point to centre of the frame, if so set. Somehow I kept moving the AF point to left of the viewfinder, presumably by pressing with my nose or accidentally touching the screen during EVF use.

Canon EOS R, Canon EF 24-105 f4 L IS @ 24mm, 1/1000, f5.6, ISO 200

Canon EOS R, Canon EF 24-105 f4 L IS @ 105mm, 1/500, f5.6, ISO 200

Using the camera for Macro work with my Tamron SP 180mm f3.5 IF macro lens was easy, yielding very good sharp results with good colour and fine detail. Also the lens mount adapter acts as an 24mm extension tube giving that little bit more magnification through closer focussing; around 1:1.2x with the 180mm lens. The very nice manual focus indicators in the EVF made manual focus so easy, compensating for the lack of finer detail visible through the EVF. The Manual Focus graphic below was taken from the Canon EOS R Advanced User Manual.



Stamen of Anthirium flower, Canon EOS R, Tamron SP 180 f3.5 IF Macro, 1/250, f18, ISO 200, flash

The Anthirium flower was taken handheld in Manual mode using Manual Focus. The AF function on the camera and lens combo worked just fine too. Being able to zoom in on the EVF in MF setting to assist with focus detail does help to offset the initial lack of finer detail when in full frame view. It does take a little time to access the buttons to be activated for this, (refer to the user manual) so the advantage of this on skittish insects might be a little questionable. Using live view on the articulating screen and magnification activated before approaching the subject is also a possibility. Nevertheless I feel this could be a really nice macro camera.

Using the camera for wildlife type photography proved it to be a very capable camera used within its limitations. Frames captured on more static birds are as good as the best out there in image quality, with good colours and detail captured with my trusty Sigma 120-300 f2.8 OS with a 2x Extender. In this application that EVF freeze does not really play a role and a high keeper rate was achieved during this session.

The bathing Yellow-billed Duck and foraging Grey Crowned Crane was captured using the camera/lens combo mounted on a monopod in a belt pouch, Av mode, one shot AF with back-button focus.

Canon EOS R, Sigma 120-300 f2.8 OS with 2x Extender, 1/125, f5.6, ISO 400

Canon EOS R, Sigma 120-300 f2.8 OS with 2x Extender, 1/160, f5.6, ISO 800

Similarly when using my Sigma 300-800 f5.6 USM, a notoriously picky lens, on a wildlife shoot the images from the EOS R were of top quality, sharp, detailed, good colour and definition, soft and

pleasing bouquet. One cannot ask for more from any camera. Refer to the photos of the buffalo and Crested Barbet below.

Canon EOS R, Sigma EX 300-800 f5.6 HSM, 1/3200, f5.6, ISO 1250

Canon EOS R, Sigma EX 300-800 f5.6 HSM, 1/4000, f5.6, ISO 1250

Another positive attribute of the EOS R that really impressed me was its compatibility with Canon RF, EF, EF-S and third party EF mount lenses. My Sigma's in 120-300 f2.8 OS HSM and 300-800 f5.6 HSM models and my Tamron SP 180m f3.5 Macro IF, worked perfectly from the moment I first mounted them on the body, same as my Canon EF 24-105 f4 L IS and Canon EF-S 17-85 f4-5.6 borrowed from my niece.

As a professional action and sports camera, well….. less than ideal. I honestly believe this camera was not designed as a pro sports body, rather as a good mid-range general use body. That said, for most enthusiast and hobbyist photographers it will be good enough, providing very acceptable results. I am making this statement not because of the AF performance, which was quick and accurate enough for most users once locked on and using any of the available high end lenses I had on hand, but rather for the EVF refresh rate and freeze when taking the first shot, which means you cannot see what you are tracking for the next two shots at 5 fps through the EVF. Similarly when using live view mode – the refresh rate is just too slow for that. Live view using longer lenses is also rather difficult and uncomfortable.

The running–on-water Red-knobbed Coot is a typical example; these birds do a very rapid sprint across the water using a combination of their wings and huge webbed feet. Tracking them is much of a hit and miss affair with the EOS R; the camera and lens combo was mounted on a monopod used from a belt pouch. I managed the first shot but with the shutter lag and refresh rate this very fast bird was almost out of the frame by the time the shutter tripped, didn't see the next two frames and was panning as I thought best, only again seeing the action on the last one with bird already out of the frame on his erratic direction of movement. The AF picked it up well enough, and then I hoped for the best. I am rather good at panning, can keep a subject centred in the viewfinder easily enough. This wasn't one of those times.

Canon EOS R, Sigma 120-300 f2.8 OS with 2x Extender, 1/1250, f8, ISO 1250

The noticeable but slight shutter lag also forced me to adapt my reaction times, especially when shooting an off-road race I covered recently. It is usually easy for me to time my shots using AI Servo on my Canon EOS 1D MkIV or EOS 1DX with the Canon EF 24-105 f4 L IS lens and get the cars consistently just lifting over the jumps with the sequence of lifting – flying - more flying - touchdown one front wheel - touchdown more wheels - fully on the ground. With the EOS R I had to press the shutter that fraction of a second earlier to get the same result, otherwise the cars would already be airborne and almost on touchdown again for the first shot. Note that I am not referring to the slower frame rate (5 fps for the EOS R as opposed to the 10 for the 1D MkIV – this was set slower to 5 fps as well, providing a comparison under similar situations) AF pick-up and lock-on with the older 1D MkIV was quicker and more accurate, even my niece with her old Canon EOS 60D and EF-S 17-85 IS lens had a higher keeper rate that what I initially managed to achieve with the EOS R. What also didn't help was the fact that the EVF freeze made tracking the off-road race cars very difficult indeed, resulting in many cropped bonnets, or roofs, or rear ends. This is not the ideal camera to capture action moments in series using tighter framing. It will do in a pinch, using a more loosely framed composition, but don't expect it to provide a stellar performance all the time. It took me a while before

I managed to track and time the off-road cars for best results, with some frames coming in really nice, but a lot of them not so.

Canon EOS R, Canon 24-105 f4 L IS, 1/160, f7.1, ISO 200,

The Stryker pictured was captured after I consciously started tracking the subject earlier, and pressing the shutter button that fraction sooner that I would with my 1D series bodies. I did find that sometimes the AI Servo would lose the subject after the first or second frame, only picking it up again after the fourth or so frame. For this shot the camera was in Tv mode, AI-Servo, using the EVF, back-button focus set-up, handheld

Getting my hands on Canon RF 24-105 f4 L IS lens really showed me how this new RF lens mount system can perform when using a designed for lens. I took the combo to the South Africa vs Argentina rugby match at Loftus, the “send-off” test match before the team departs for the World Cup. Unfortunately due to SA Rugby limitations placed on accredited media, I am not allowed to present any images showing the match or official ceremonies, but I can do so with support photos. In this application the EVF freeze was not any hindrance, and photos taken showed the very fast AF of the lens, it’s really good image quality and the overall excellent performance of the EOS R using a RF mount lens similarly to the performance I experienced with the RF 85mm f1.2 lens mentioned earlier. The very difficult and contrasting light was not a problem for camera and a balanced image was easily obtained using the DPP software.

Canon EOS R, Canon RF 24-105 f4 L IS @ 105mm 1/320, f4, ISO 400

Canon EOS R, Canon RF 24-105 f4 L IS @ 70mm 1/400, f4, ISO 400

Canon EOS R, Canon RF 24-105 f4 L IS @ 24mm 1/50, f9, ISO 400

SUMMARY

So where does this leave us? With a very capable all-rounder, quite small and light Mirrorless digital camera which can use a very wide variety of lenses, delivering really good images and video clips under a wide range of conditions, which does not ideally include fast-paced action type photography.

Pricewise and at the time doing this review it is at the upper end of the range and one can only assume Mirrorless technology will become more affordable with time and volume, right now in South Africa you can get a Canon EOS D-SLR for half the price of the EOS R, and with more all-out performance. Yes it will be an APS-C sensor body instead of full frame. But you can also get an EOS 6D MkII full frame D-SLR with a nice lens for less than the EOS R body only, but the EOS 5D MkIV body with the same sensor will take 50% more of your hard-earned cash and not provide the extra boost of the Digic 8 processing. Each user will have to decide what he wants, what he requires, and what he can afford on the available budget.

If a full fame, feature rich and rather compact Mirrorless Canon camera is your requirement, then this is it; the Canon EOS R is certainly recommended by this photographer.

Many thanks to the following supportive people:

Conal Benson for providing the test camera

Roger Machin from Canon SA for providing assistance in the background to the RF mount system and confirming my fine-tuned the set-up, menu explanations and his supply of RF mount lenses

Wynand Rohde for giving a second opinion on photographic results and comparisons.