

Powershot S3 and Powershot S5 – Two Generations of Ultra-Zoom Cameras by Canon

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In common practice, the comparative test aims at distinguishing the advantages of one producer over another within one and the same price category and functional group. That is why models by different producers representing the same section of the market are taken for observation. Canon cameras are usually compared with their group-mates from Panasonic, Sony or Nikon. But we at DigiCamFriends.com have agreed to take another way and get to know what obvious innovations may be found in the Canon PowerShot S5 IS (hereafter, Canon S5) in comparison with the Canon PowerShot S3 IS (hereafter, Canon S3) that used to be extremely popular.

Let's imagine we know nothing about new features developed by Canon for the new model S5 that appeared after the Canon S3...

Physical view

Canon models of S – series, being different from another Canon PowerShot "subclass" (that is models of A-series), are characterized as "amateurish" but with some skills of "professional". This is for report or art-report shooting, but not for the motionless photos, something like "a tree and me" type. From this point of view both models have a very handy design.

In fact physical view of the camera has not been changed, except first- the enlarging of the movable screen from 2 to 2.5 inches and second- the replacement of one of the control buttons. And while the latter novelty hardly seems to be pleasant, the first one fits quite natural- it's become more convenient to take photos with a larger screen.

Pic.1: Canon PowerShot S3 IS and PowerShot S5 IS; front.

Pic.2: Canon PowerShot S3 IS and PowerShot S5 IS; rear.

Pic.3: Canon PowerShot S3 IS and PowerShot S5 IS; movable screens.

Optics

The cameras have the same lens construction type with identical settings (the market interpretation of the term construction – the quantity of the optical elements and it's groups). Unfortunately, there was no information found on the manufacturer's Web-site mentioning that these lenses are identical; so I won't insist on theoretical view point, but make a display with some photo examples.

Example 1 : Shots with max. depth of field (the aperture priority mode, the shutter is closed down; Flash is on; ISO80 sensitivity; the white balance – "Flash"). The distance between the objects is about 15-25 cm. Auto focus on the handle of the cup. On the left is a shot taken by the Canon S3, on the right, by the Canon S5.

Example 2 : Shots with min. depth of field (the aperture priority mode, the shutter is absolutely open; Flash is on; ISO80 sensitivity; the white balance – "Flash"). The distance between the objects- about 15-25 cm. Auto focus on the handle of the cup. On the left is a shot taken by the Canon S3, on the right, by the Canon S5.

These cameras are recognized among the majority of digital cameras for equally good color reproduction and quick focusing on the objects, even if

they are trying to escape from your camera.

Example 3: Focus on objects moving to and fro with 12x optical zoom in. On the left, a shot taken by the Canon S3, on the right, by the Canon S5.

It doesn't make much sense if we start making a display of numerous examples of similarities between these cameras. We'll stop making trivial comparisons of their features and proceed to noting peculiar and individual characteristics discovered during the experiments.

The Imperfectness of the Lens

Practical optics has very little in common with the geometrical sums in the physics lessons that students solve while learning about cameras as a kind of equipment. But however accurate the calculations may be, even the most carefully developed (and rather expensive) model of the lens is not completely perfect. For example, there can be chromatic aberrations, when the objects on the image are colorfully haloed. Test results show that both cameras have the same level of chromatic aberrations. Surprisingly, in spite of the progress of the competitors, Canon hasn't manage to overcome this problem when developing the Canon S3 into the Canon S5, even after the evolution within internal toolkit. On the whole, in my point of view, the number of drawbacks of cameras for ultra-zoom class is high.

Example 4 : chromatic aberrations are the colourful halos around the bridge footing. This example also displays the difference of the sharpness of the objects in the photo taken by different cameras, but we'll discuss it later. At the top is the whole shot with the testing area highlighted. On the left is a shot taken by the Canon S3, on the right, by the Canon S5. For both cameras we set semi-auto "Landscape" mode with completely closed aperture, 12x optical zoom in.

Shooting Close-ups – Macro modes

Macro-shooting is not an easy task for a camera, designed as the "the mater of landscape photography". The technical characteristics for shooting bugs and spiders are just opposite of those for shooting sun-sets and mountain landscape. There are numerous items that can be evaluated to identify the macro capacity of the camera. In particular, there is a famous test based upon not simply measuring the distance from the lens surface necessary for focusing, but making a photo of a small object within the whole shot. The smaller the object, the higher degree of macro capacity of your camera has.

We agreed to experiment upon the monetary unit of our country - coins of different values.

For both the Canon S3 and the Canon S5, macro-shooting is available in two different modes: "macro" and "super-macro". We had expected to get the similar results, but it turned out that, with the Canon S5, the borderline between these modes suffers influence of its predecessor. While "macro" mode of the Canon S3 enables you to take a photo of 5 coins, that enlargement is not enough for the Canon S5 for it's limit is 6 coins (shooting of 5 coins requires "super-macro" mode).

Example 5: On the left, a shot taken by the Canon S3; on the right, by the Canon S5.

After experimenting at length with "super-macro" mode we managed to take the image of a single coin. By the way, the coin is 15.5 mm in diameter.

Unfortunately, this test can't be characterized as complete. It might be possible to take photos of much smaller objects on the whole screen provided there is extra lighting (the cover around the lens prevented the addition of more light...in fact the lens was resting on the object; we had to build up a flash reflector, manually-set ISO200 sensitivity, and at last lighten the image with an image editor program.

Example 6: "Super-macro" mode. On the left, a shot taken by the Canon S3, on the right, by the Canon S5. The lack of light forced us to set the sensitivity to a high ISO level, and the bright halo around the coin is nothing but a flash, spread all over the tightly-stretched piece of white paper.

Sensor and ISO speed

Both cameras have sensors of 1/2.5" size, the number of effective pixels (pixel value) is 6 - 8 megapixels. Nowadays 8 megapixels for that type of sensor seem to be the limit (A greater number is quite possible, though it might be not economically feasible).

An important characteristic of digital camera, referring to its sensor, is ISO speed. The manufacturer gives the ISO speed scale from 80 to 800 for the Canon S3 and up to 1600 for the Canon S5. Let's experiment to evaluate data in low light condition.

Example 7: ISO80 speed. At the top is the whole shot with the testing area highlighted. On the left is a shot taken by the Canon S3, on the right, by the Canon S5 (shutter speed priority mode, external light; for better observation the highlighted areas are enlarged in an image editor).

Example 8: ISO100 speed. At the top is the whole shot with the testing area highlighted. On the left is a shot taken by the Canon S3, on the right – by the Canon S5 (shutter speed priority mode, external light; for better observation the highlighted areas are enlarged in an image editor).

Example 9: ISO200 speed. On the left is a shot taken by the Canon S3, on the right, by the Canon S5 (shutter speed priority mode, external light; for better observation the highlighted areas are enlarged in an image editor).

From the examples above we may see that an ISO speed within 80- 200 scale makes good results for both cameras, although the results with the higher ISO speeds are not so clear.

Example 10: ISO400 speed. Same cameras and same conditions as above.

Example 11: ISO800 speed. Same cameras and same conditions as above.

While shooting with ISO400 sensitivity gives equally good results, the setting of ISO800 sensitivity enables the new internal algorithm of noise reduction in the Canon S5 to come into play (Heaven knows how it happens – either via auto or programmed mode). As for ISO1600 sensitivity, it is absolutely useless; even the above mentioned noise reduction mechanism doesn't cope with the noises. Though the manufacturer doesn't hold this option back from customers.

Example 12: ISO1600 speed of the Canon S5. The same image patch, as in the previous examples (the shutter speed priority mode, external light; for better observation the marked out areas are enlarged in image editor).

By the way, during the experiments with ISO speed, another peculiar feature of both cameras had been noticed. They manage to operate the white balance mode equally good, except when the white balance mode should be set manually at high ISO speed (800 and 1600). The noises of the sensor seem to appear in the program accepted averaged color, that is white.

It is not a great obstacle to overcome for usually the candlelight is used at such a high ISO speed (the dim light of a table-lamp and dingy street-lamps, for example) and you may choose the appropriate manual setting. Still, it is strange why such an imperfect algorithm inherited from its predecessor didn't go through any changes.

Focusing on the distant objects

It has already been mentioned (discussing chromatic aberrations) that we get different results when focusing on distant object by Canon S3 and Canon S5. To check the fact we shot a series of landscape images with 12x optical zoom in. The semi-auto "landscape" mode was set to provide completely closed aperture along with the other auto-set characteristics (in other words to realize the greatest possible depth of field). To meet the non-stop character of the experiment, the test shots were taken at once without choosing the object to focus on but as soon as the camera informs that its ready to shoot (as soon as it has focused on). In addition, to avoid different views of nature by the cameras, we set "Spot focus" mode. Let me show you the effect referring to the series of shots of a TV tower.

Example 13: Focusing on distant objects with 12x optical zoom in ("Landscape" mode, "Spot focus" mode). At the top is the shot of the landscape without enlargement; in the middle- the same landscape with 12x optical zoom in (with highlighted testing area). At the bottom to the left is the image by the Canon S3, at the bottom to the right, the image by the Canon S5 (both shots have been enlarged in an image editor).

The results show the pre-eminence of the Canon S5 working in auto focus mode. Probably, the Canon S3 might have shown not as bad results, if it were used in manual focus mode, but then it would break the conditions of the experiment.

Toolkit

"Sharpness" is available for both cameras, being called "Rezkost" in Russian texts. It attracted most attention among the other settings, because in a way it may be regarded as the equivalent of the internal noise reduction option (it doesn't reduce the noise but highlight the edges, that make impression of a high-quality shot). To test that no changes had been made within the algorithm, we took a number of shots with 400ISO speed (the noises are already conspicuous, but they do not prevail).

Example 14: Internal algorithm of increasing "Sharpness" for the Canon S3 and the Canon S5. At the top the photo with highlighted testing area. In the middle, a shot to the left, taken by the Canon S3 without increasing sharpness, a shot to the right, taken by the Canon S3 at a "high" level of "Sharpness". In the row below the same operations with the Canon S5.

Based upon the examples above, we may say that this algorithm as well didn't go through great changes: such a "delicate" way of increasing

sharpness with a few artifacts left. It seems as though the manufacturer had not intended to update toolkit for a new model.

The algorithms of compression

It's a pity, but neither of the cameras deals with RAW files (despite the Canon S5 sporting a new feature which is characteristic of a professional camera; that is, the flash hot shoe for external flash); all the image files are saved in JPEG format with various degree of resolution and compression (both are manually set). To compare the internal algorithms of compression we shot 2 series of photos in "Landscape" mode (to provide the best depth of field on the small far details). The center of the shot had been taken for the testing area to eliminate possibly the influence of the imperfect optics; all the changes were made in BMP format in order to make JPEG artifacts more conspicuous, and at the same time, not to add any extra while preparing shots for publishing; all the image patches were enlarged in the end.

Example 15: The comparison of the internal algorithms of compression for the Canon S3 and the Canon S5. At the top- the photo with highlighted testing area. The shots with the increasing degrees of compression follow below. On the left are the shots taken by the Canon S3, on the right, by the Canon S5.

The above examples display that the Canon S5 inherits from its predecessor the Canon S3 the visual effect of compression even for the high-quality images. I would recommend either increasing the super- quality of JPEGs (by any possible way) or contribute RAW- format (TIFF/ BMP- any of the formats that compresses without faults); the cameras really suffer from the lack of one!

Features

Among the pleasant innovations for Canon S5, such have been noticed (though not checked):

- extensive work with the same set of batteries (170 shots in stead of 110 – according to the results of the standard test by the manufacturer);
- a hot shoe and sync-contact for external flash.

Summing up

After practical work with both cameras, we at DigiCamFriends.com may conclude that some changes indeed have been made for the new model. This can be observed in such operations as focus on distant objects with high optical zoom or with high ISO speed. These new features helped to correct utter drawbacks found in the Canon S3, in comparison with the success of the similar pairs of cameras by other manufactures. The question is would you agree to pay for these innovations?

About the Author

© 2008, *Imyaz Familik*, DigiCamFriends.com Imyaz Familik is the expert of DigiCamFriends.com, the project devoted to digital photography and operations with it. He has been accepted to take up the responsibility of testing all the photo equipment that we come across with in our material. Imyaz has a good experience in taking photos and on the basis of his theoretical knowledge about the subject, he can write interesting articles and reviews.

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