

## f- STOPS and all that jazz.

New photographers and particularly new digital camera owners start out believing that they do not have to know about exposure; after all, this expensive, fully automatic masterpiece of the camera maker's art (if you believe advertising blurb) will do it all for me – perfectly. In truth the fully automatic camera does an amazingly good job provided that the lighting conditions are favourable – even light, not too much contrast.

As soon as beginners start to criticise their own work they realise that conditions are seldom favourable and those that provide the opportunity for stunning results need careful control of exposure. They begin to discuss exposure with their more experienced friends and immediately run into gobbledygook – f Stops, shutter speeds, apertures and EV numbers.

Photographers think about exposure in terms of quantities of light that increase or reduce by doubling or halving. When twice as much light enters the camera the exposure is said to have increased by one "Stop" (or reduced by one "Stop" when half as much light enters the camera).

Exposure is controlled by two things – the time that the shutter is open – shutter speed, and the size of the opening inside the lens – aperture. Both change but to make life easy they usually change with set intervals of 1 Stop with a midway interval of ½ Stop. (more sophisticated cameras may have 1/3 Stop intervals) The important thing to realise is that if the exposure changes by less than ½ Stop, you will not be able to see the difference in the final image.

Typical shutter speeds and apertures are listed below with 1 Stop intervals in bold type. Shutter speeds are in fractions of a second whereas apertures are quoted using a mysterious number called an f-number, an f-stop or focal ratio.

Speeds:    **1/1000** <sup>1/750</sup> **1/500** <sup>1/350</sup> **1/250** <sup>1/180</sup> **1/125** <sup>1/90</sup> **1/60** <sup>1/45</sup> **1/30** <sup>1/20</sup> **1/15** <sup>1/10</sup> **1/8**

Apertures:    **f 2**    <sup>f 2.4</sup> **f 2.8** <sup>f 3.5</sup>    **f 4** <sup>f 4.5</sup> **f 5.6** <sup>f 6.3</sup>    **f 8** <sup>f 9.5</sup> **f 11** <sup>f 13</sup>    **f 16** <sup>f 19</sup> **f 22**

**Note:** An exposure of 1/1000 second at f 2 is exactly the same as the exposure of 1/8 second at f 22. The first has a short shutter speed and a large aperture but the second a long shutter speed and a small aperture. Confusingly, small f-numbers mean large apertures. The larger the f-number the smaller the aperture.

When an exposure is increased from say, 1/500 second at f 8 to 1/125 second at f 8, the exposure is said to have increased by 2 Stops. The exposure has doubled twice – from 1/500 to 1/250 and again from 1/250 to 1/125 second, the aperture remained the same.

Simple, once you have grasped the meaning behind the somewhat confusing numbers. Next month I will talk about how changes in exposure affect images.