

## Notes for the 6 October Digital Workshop - pre-workshop draft

(Barry Pearson, 5 October 2009)

An updated version will be published soon after the digital workshop.

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### "Back to basics"

Exposure and ISO – And how to compensate for compromises

#### Theme of this session

- The aim here is to emphasise the linkage between aperture, shutter speed, and sensitivity
- Then to show how artistic considerations force compromises
- And to show that the easiest compromises tend to result in high-ISO values
- And finally to show how noise from high-ISO values can be reduced

#### It's all connected!

- Whatever you want to change, you end up changing other things as well

#### Sunny f/16 rule

- Set shutter speed to (reciprocal of) ISO, and ....
- Bright sun: f/16
- Hazy sun: f/11
- Cloudy-bright: f/8
- Cloudy-dull: f/5.6
- Backlight: consider 2 stops more exposure
- Within 2 hours of sun-rise/set: consider 2 stops more exposure

#### Varying the aperture

- Apertures are varied for artistic reasons
- They are constrained by technical issues

#### Varying the shutter speed

Shutter speeds vary for artistic reasons

- There are also practical constraints

#### Ideal

- If there were no bad consequences of high-ISO, we would simply set the aperture and shutter speed to the best, or the safest, values
- Often this would be small apertures and fast shutter speeds, hence high-ISO
- But there is a consequence – noise
- So if we can reduce noise, it gives us more artistic and/or safer options for apertures & shutter speeds

#### Noise







- Noise is the digital equivalent of film grain!
- It varies from camera to camera
- It is least visible (often invisible in practice) at low ISO values (example ISO 100)

- It typically becomes visible at (or before) high ISO values (example ISO 6400)
- It can be tackled to a significant extent by specialised software

### Learning points

- Know your camera – features and limitations
- Know your lenses – aberrations, etc
- Identify what your settings were for your good shots and your bad shots
- Identify the constraints that your choice of software imposes on your settings

### Photographs used for illustration

	Summary	Focal length	Aperture	Shutter speed	Sensitivity
	Illustrates the constraints	31	f/9.5	1/45	100
	Too much depth of field	180	f/6.5	1/350	200
	Not enough depth of field	300	f/6.5	1/500	200
	OK against the odds - more depth of field would have been safer	100	f/5.6	1/250	400
	Depth of field right	250	f/11	1/1000	800
	Snatched shot, but depth of field accidentally OK	180	f/5.6	1/4000	800



Would be interesting to see this with  
lots more depth of field

68

f/13

1/250

800



Too much depth of field

250

f/11

1/500

800



In retrospect, depth of field OK

25

f/11

1/250

800



Too much depth of field

75

f/8

1/250

800



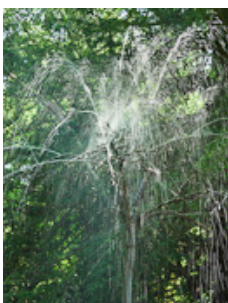
Rain in streaks - shutter speed OK

250

f/8

1/125

800



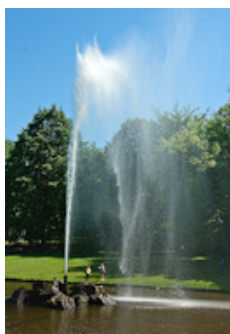
Water on streaks - shutter speed OK

53

f/8

1/30

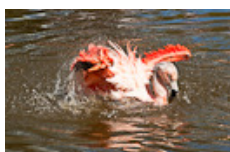
200



Water sharp 28 f/8 1/1000 400



Water sharp 17 f/11 1/500 800



Water sharp, bird wingtip movement 300 f/8 1/750 200



Water sharp 250 f/5.6 1/8000 1600



Ignition sharp 250 f/8 1/1000 800



Aircraft sharp - propeller stopped 250 f/8 1/2000 800



One plane very slightly blurred - faster shutter speed preferred 200 f/11 1/4000 800



Too much depth of field, shutter speed OK 108 f/11 1/500 800



Extreme panning effect - worked in practice 60 f/22 1/30 100



Too much depth of field, not enough pan effect

170

f/16

1/180

800



Hm!

128

f/27

1/90

800



Dog is sharp enough

200

f/11

1/500

800



Helicopter sharp - rotor nearly stopped

300

f/11

1/2000

800



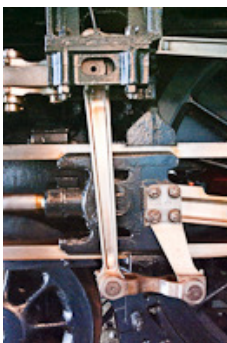
Plenty (too much) depth of field

43

f/11

1/2000

800



Handheld - slight camera shake

24

f/8

1/4

1600



Not enough depth of field

45

f/4

1/10

800



Not enough depth of field

45

f/4

1/20

800



Depth of field about right; hand-held  
and lucky to get it sharp

100

f/13

1/16

1600