



I am not a magic box. **We** make magic together!



I am not a magic box. **We** make magic together!

No-one says J K Rowling must have a really great typewriter!!

Locksheath and Sarisbury Camera Club

Basics Course Week 2

Life after AUTO!

Last time we experienced problems with AUTO

Basically no control!!

- No control over exposure
- No control over focus
- No control over shutter speed or aperture
- No control over white balance

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Our skier had trouble with snow and black ash!



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Our skier had trouble with snow and black ash!

We had to increase exposure for very bright scenes and decrease it for very dark ones

sNOW MORE AUTO

Reciprocal Rule for Hand Holding Camera

Image Stabilisation gives you sharp pictures below the Reciprocal Rule

300ml lens @ 1/320th second

300ml lens @ 1/15th second



White Balance Nightmare!!

Blue Daylight

Red Radiant Heaters

Green Fluorescent lighting



Camera Modes

Automatic
Depth of Field



Canon

Manual

Aperture Priority

Shutter Priority

Program

Guide

Auto

Portrait

Landscape

Macro

Sports

Night Portrait

No Flash

Child

Nikon



Camera Modes

Camera Mode	Auto	Programme	Tv /S Priority	AV /A Priority	Manual
Exposure Compensation + /-	-	-	Yes	Yes	Yes
Shutter Speed	-	-	Yes	-	Yes
Aperture	-	-	-	Yes	Yes
White Balance	-	Yes	Yes	Yes	Yes
ISO	-	Yes	Yes	Yes	Yes

Camera Modes

B (bulb) setting

The shutter stays open as long as you have the button pressed

Exposure = 11 seconds with 4 flash firings

(music – Swan Lake)



Good exposure is getting the right amount of light

Shutter Speed

Motion

**The
Exposure
Triangle**

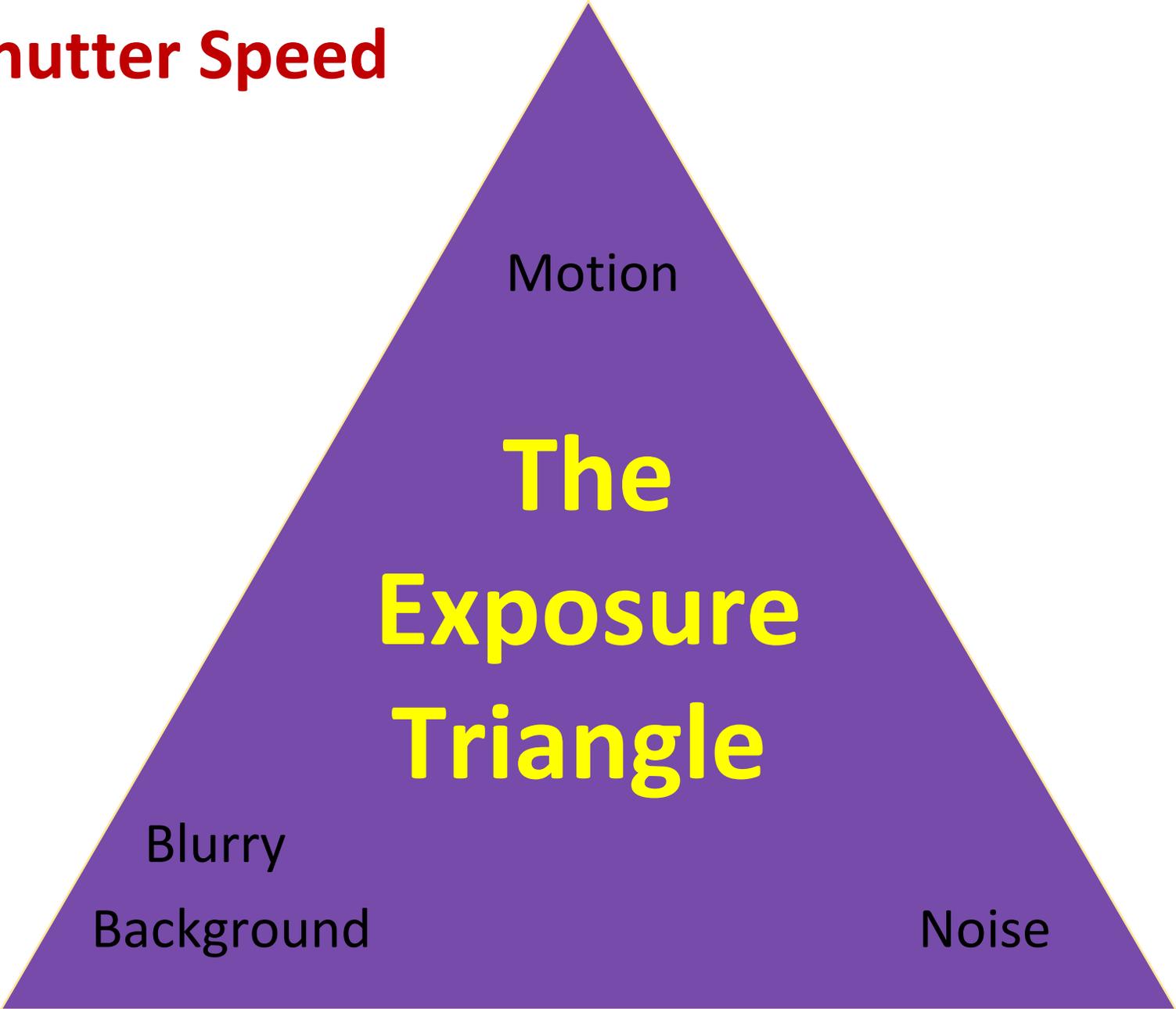
Blurry

Background

Noise

Aperture

ISO



Good exposure is getting the right amount of light

This depends on,

How long the exposure lasts

- **Shutter Speed**

How big the opening is

- **Aperture**

Power to the sensor

- **ISO**



f stops

- Each **STOP** to the right doubles the exposure
- Each **STOP** to the left halves it



f Stops

- Each **STOP** to the right doubles the exposure
- Each **STOP** to the left halves it

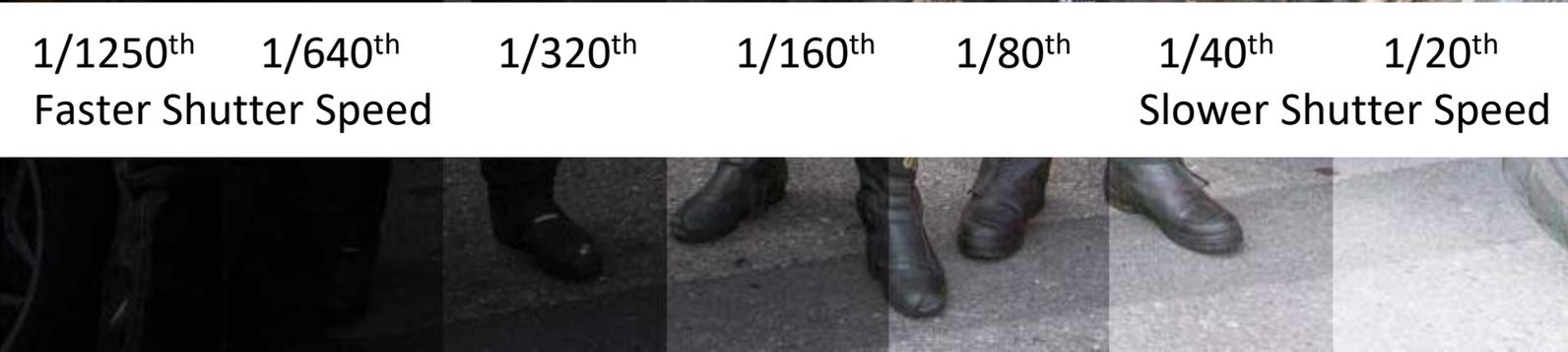
The three controls are usually calibrated into 1/3rd **f Stop** intervals



The photo was taken at **Shutter Speed** 1/160th sec

Below shows what would have resulted varying the shutter speed up and down

The slower the Shutter Speed the more light gets in



1/1250th 1/640th 1/320th
Faster Shutter Speed

1/80th 1/40th 1/20th
Slower Shutter Speed

f/1.4



f/2



f/2.8



f/4



Aperture openings double /halve in size

f/5.6



f/8



f/11



f/16



The bigger the number the smaller the hole



The photo was taken at Aperture f11

Below shows what would have resulted varying the aperture up and down





The photo was taken at ISO 100

Below shows what would have resulted varying the ISO up and down

ISO 12 ISO 25 ISO 50 ISO 100 ISO 200 ISO 400 ISO 800



Photographers seem to divide into those who use

- **Shutter Priority (Tv /S)**
- **Aperture Priority (Av /A)**

These are handy camera modes for using the camera's automatic exposure meter in the way that you choose.

It depends on the sort of photography you are involved in.

Shutter Priority Mode

You decide the shutter speed required and let the camera adjust the aperture to give the right exposure.

Useful where motion is the key factor e.g. sport, wildlife etc.

The slower the shutter speed

- the more light that gets in
- the more blur from any motion

In the following pictures **Shutter Speed** was important



30 second exposure
Using a 'Big Stopper'
Filter

This gives flat milky-like
sea



Jazz at the Barn

50 mm lens 1/10th at f5 with ISO 500

Slow enough to get the hand blurry but the eye sharpish

Note the breaking of the Reciprocal Rule!



300 mm lens at 1/250th at f8
with ISO 100

Battle of Britain 75th Anniversary

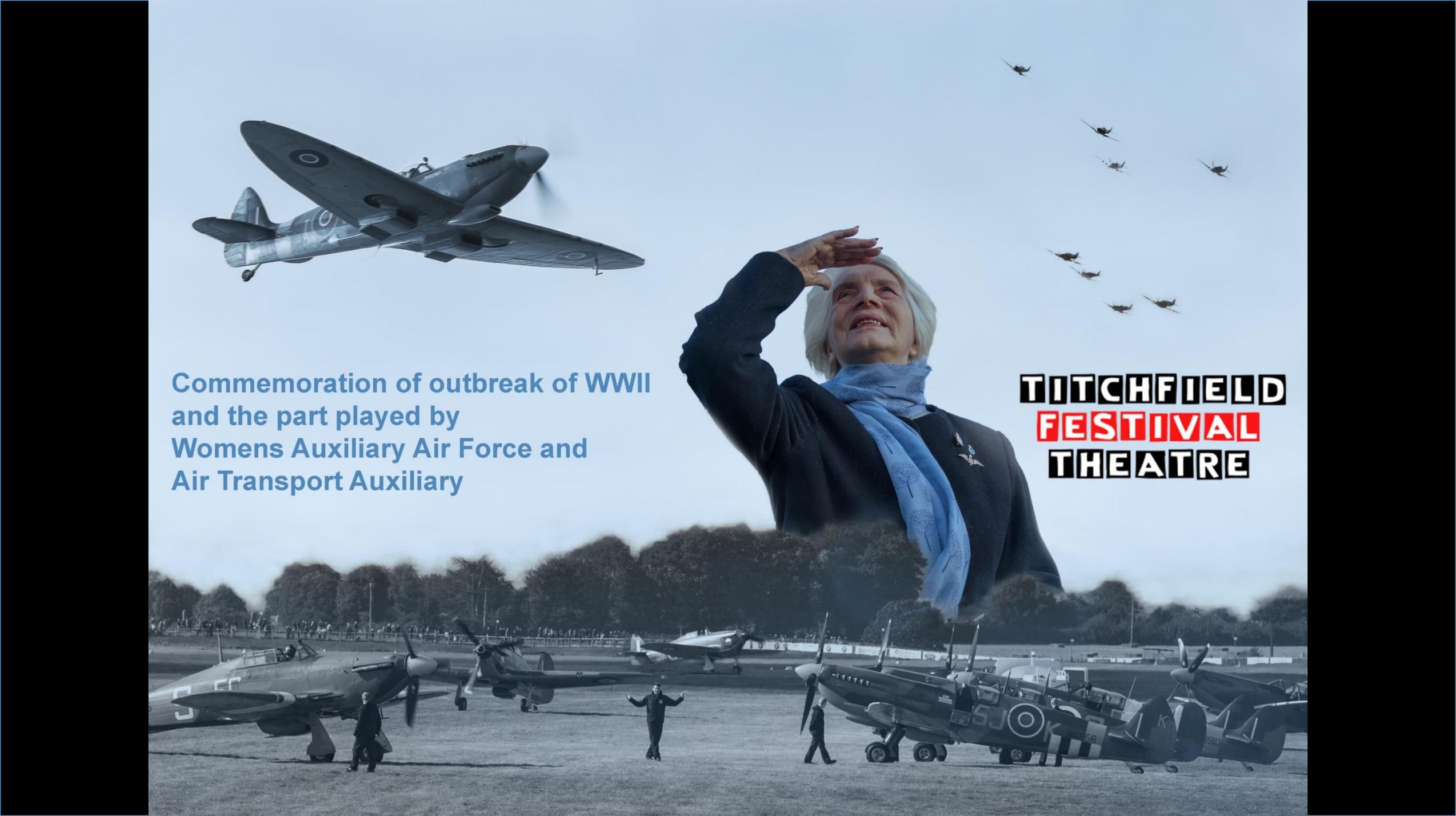
Shutter Speed

1/160th



1/1000th





Commemoration of outbreak of WWII
and the part played by
Womens Auxiliary Air Force and
Air Transport Auxiliary

TITCHFIELD
FESTIVAL
THEATRE

The Saga of Ken
and Sandra 9 - 19 January



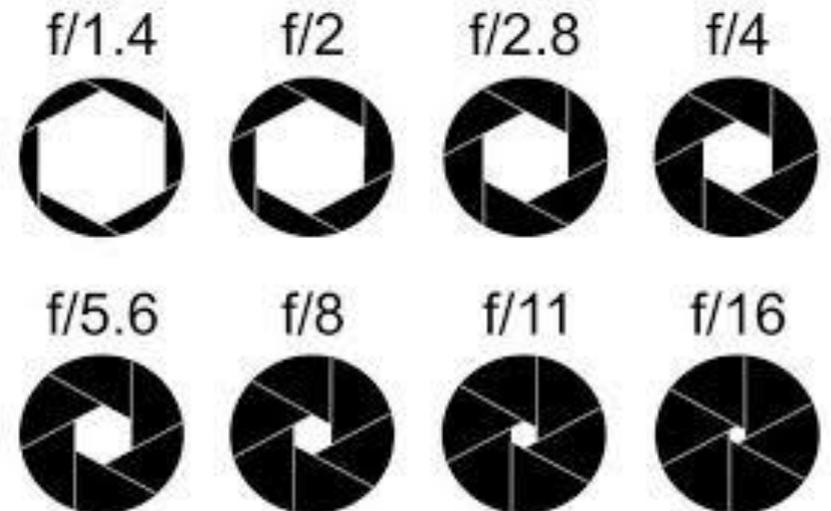
TITCHFIELD
FESTIVAL
THEATRE



500 mm lens on tripod at
1/1250th at f4 and ISO 400
Regular bird-photography
settings

Aperture

- **Aperture** - f Stop, or size of the hole,
- The smaller the hole,
 - less light gets in
 - more of the picture in focus



Aperture Priority Mode

- You set the aperture and leave the camera to sort out the necessary shutter speed
- Good where depth of field is critical – do you want the background in focus or not?

Depth of Field

f1.4

f8





300 ml lens at f5.6



same lens at f22



70 ml lens at f4



same lens at f22

Depth of Field increases as the lens is stopped down (f4 to f22)

Depth of Field increases the shorter the lens (wider angle)

Depth of Field

f/1.4



Larger the opening	>	
Longer the lens	>	Smaller Depth of Field
Closer to your subject	>	

Depth of Field

	< Smaller the opening
Bigger Depth of Field	< Shorter the lens – wide angle
	< Further away from subject



In the following pictures **Aperture** was important



50 ml lens at f1.4, sec, and ISO 50

I wanted just Frances' eyes in focus and background totally blurred (flash with umbrella)

1/4000th

1/5000th





16 - 35 zoom lens set at 16 mm, 1/80th second, f18 at ISO 400.



Bokeh exercise

70-300 lens at 300mm $1/125^{\text{th}}$
at f5.6 ISO 1600

300 ml at f13



700ml at f5.6



TITCH
NATIO

Bird nesting,



f2.8

ISO

- **ISO** The power the camera puts through the sensor.
- More power = More sensitive = Captures more light,
but gives more 'noise' (grain in the picture, or flecks of colour)
and gives bigger file sizes



Fire Fairy, 70-300 lens at 182mm
1/8000th at f5.6 at ISO 25600!



Fire Fairy, 70-300 lens at 182mm
1/8000th at f5.6 at ISO 25600!

1/125th would have been fine

6 Stops difference!

so at ISO 400 it would have been a
less noisy image

Trophy presentation

Indoors:

Low Light

Different W/Bs

1/80th at f4, ISO 1000



WARNING with both Shutter Priority or Aperture Priority:

With your superior knowledge of exposure

You won't be fooled by very bright, or very dark subjects

'sNOw MORE AUTO'

and will add more light for the snow and less for the black ash

Exposure Compensation - Set 1 or more stops + or – until the exposure is right for you.



Manual Mode is if you need to set both shutter and aperture

500mm lens with 1.4 converter = 700mm
f5.6 and ISO 320

What would the meter make of a subject which was both black and white!!

Shutter Speed



Motion

The Exposure Triangle



Aperture

Depth
of Field



Noise

ISO

TECHI STUFF

Aperture sounds complicated, but is just the light gathering capability of the lens.

This is calculated by dividing the length of the lens in mm, by the f Stop.

For a 50mm lens rated at f1.4.

Maximum Aperture = $50\text{mm} / f1.4 = 35.7\text{mm}$

TECHI STUFF

The table shows that the area of the hole roughly halves each f stop increase.

So the bigger the f stop the less light gets in.

f stop	Diameter of aperture in mm	Radius mm	Area sq. mm
f 1.4	35.7	17.9	1002
f 2.0	25	12.5	491
f 2.8	17.9	8.9	250
f 4	12.5	6.3	123
f 5.6	8.9	4.5	63
f 8	6.3	3.1	31
f 11	4.5	2.3	16
f 16	3.1	1.6	8
f 22	2.3	1.1	4
Shown on lens	50mm divided by f stop	½ the diameter	Pi times the radius squared

A 'Fast' Lens has a larger aperture and tends to be more expensive

- Canon 50mm f1.8 costs around £99
- Canon 50mm f1.4 costs around £389
- Canon 50mm f1.2 costs around £1449



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Bryan Carnathan

Canon, Nikon & Sony Cameras and lenses

more **TECHI STUFF**

Hyperfocal Distance is the closest distance at which a lens can be focused while keeping objects at infinity acceptably sharp

more **TECHI STUFF**

Hyperfocal Distance is the closest distance at which a lens can be focused while keeping objects at infinity acceptably sharp

Phone App – Hyper Focal Pro