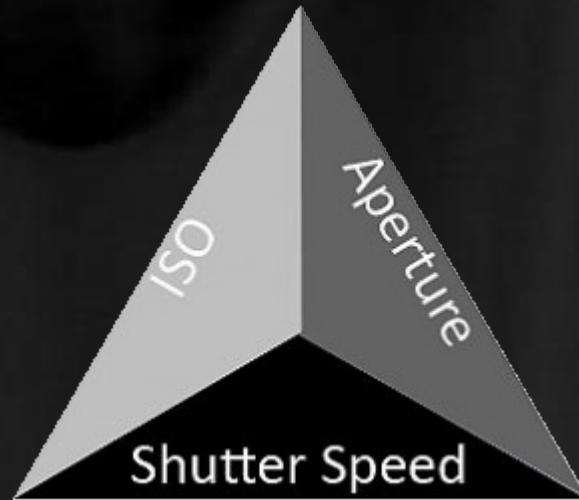


# GETTING OFF “AUTO” AND THE “EXPOSURE TRIANGLE”



Presentation for Milton Ulladulla District Camera Club  
by Brett Davis - April 2013

# What is Auto good for?

- ▣ situations where you just want to record the scene without having to think about it – like holiday snaps
- ▣ situations where getting the shot – any shot – is more important than the quality of the shot – like some photojournalist snaps
- ▣ situations where the subject is rapidly changing – like snaps from a train or car, or if you are caught up in the action – like crowd scenes
- ▣ situations where depth of field or shutter speed are not important

# What is Auto good for?

- ▣ i.e. when taking “snaps” ...
- ▣ .. but “snaps” can still be fantastic, award-winning photographs

# Is Auto good for anything else?

- ▣ No

# What is wrong with Auto?



Auto is not good for HDR (High Dynamic Range) Photography

# What is wrong with Auto?



Auto is not good for Panorama creation

# What is wrong with Auto?



Auto is not good for almost all Night photography

# What is wrong with Auto?



Auto is no good for long time exposures



# What is wrong with Auto?



Auto is no good for Lightning shots

# What is wrong with Auto?



Auto is no good for Fireworks shots

# What is wrong with Auto?

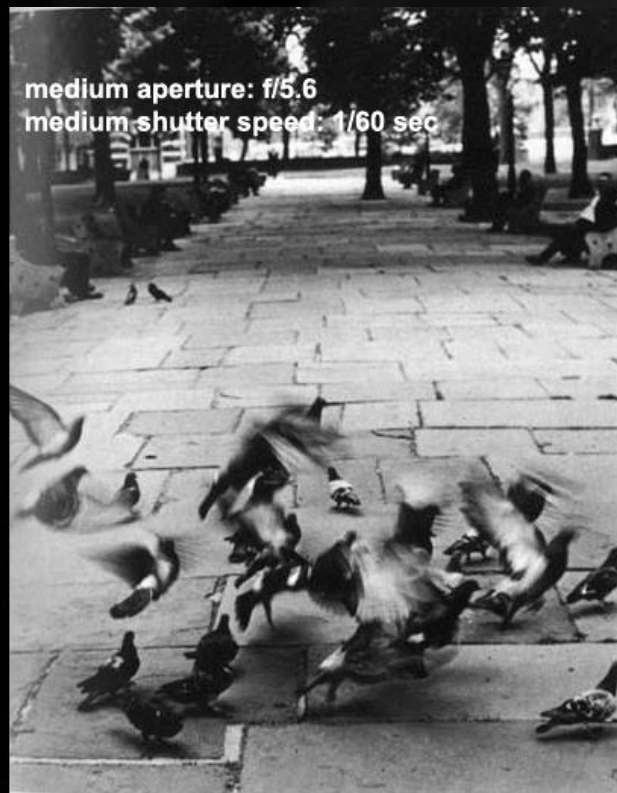


Auto is no good for any low light, long exposure photography

# What is wrong with Auto?



manual



auto



manual

Auto is no good for images where shutter speed is critical

# What is wrong with Auto?



Auto is no good for images where Depth of Field is critical

# What is wrong with Auto?



aperture...f / 2  
shutter.....1/500  
ISO.....100



aperture...f / 4  
shutter.....1/125  
ISO.....100



aperture...f / 8  
shutter.....1/30  
ISO.....100

Which photo will your camera give you on Auto ???

# What is wrong with Auto?



aperture....f /4  
shutter.....1/125  
ISO.....100

f/4 1/125 ISO 100 sun appears, twice the light  
what does your camera do?

f/5.6 1/125 ISO 100 ?

f/4 1/250 ISO 100 ?

f/4 1/250 ISO 50 ?

f/4.2 1/145 ISO 80 ? what does my camera do?  
I have absolutely no idea ...

# 1<sup>st</sup> Analogy

- ▣ using a camera on auto is like buying a Ferrari and driving it around in first gear all the time



- ▣ ... using all the gears results in a much better driving experience and better performance



## 2<sup>nd</sup> Analogy

- ▣ using a camera on auto is like being a blind squirrel
- ▣ ... you might occasionally take a great photo, just as a blind squirrel might find the occasional nut



## 3<sup>rd</sup> Analogy

- ▣ using a camera on auto is like being forced into an arranged marriage



- ▣ ... maybe you'd marry a prince or a princess, but do you really want someone else making that kind of decision for you?

## In short ...

- ▣ some photos taken on Auto could be good ,  
and occasionally great
- ▣ but photos taken off Auto could be great  
almost all the time ...
- ▣ and many photos cannot be taken using Auto

# But ...

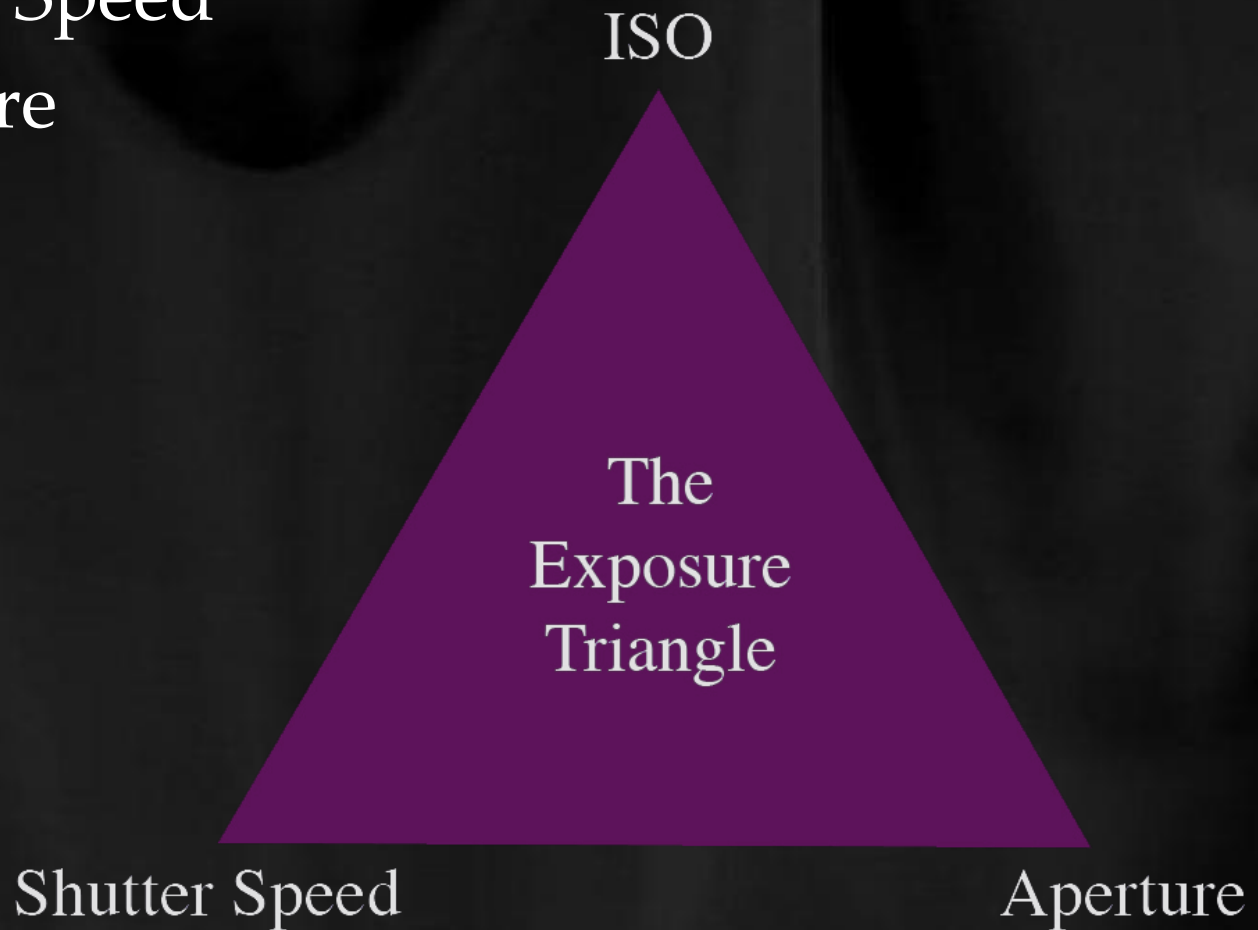
- ▣ when you take your camera off auto, unless you understand the Exposure Triangle you will not have a clue what you are doing ...

# What is the Exposure Triangle?

- ▣ Every photo needs a certain amount of light
- ▣ The correct amount of light needed is called the “Exposure Value (EV)”
- ▣ A camera has 3 ways of controlling the EV
- ▣ Those 3 ways are the Exposure Triangle
- ▣ ... and they are interdependent

# So what are the 3 ways?

- ▣ Shutter Speed
- ▣ Aperture
- ▣ ISO



# Shutter Speed

- ❑ has nothing to do with the speed of the shutter
- ❑ is the amount of time the shutter stays open
- ❑ slower shutter speeds (longer times) let in more light
- ❑ faster shutter speeds (shorter times) let in less light

# Aperture

- ▣ is the size of the opening in the lens that the light goes through when a picture is taken
- ▣ the bigger the aperture, the more light gets in
- ▣ the smaller the aperture, the less light gets in
- ▣ the area of the opening determines the amount of light that gets in
- ▣ twice the area, twice the light
- ▣ half the area, half the light



# Aperture

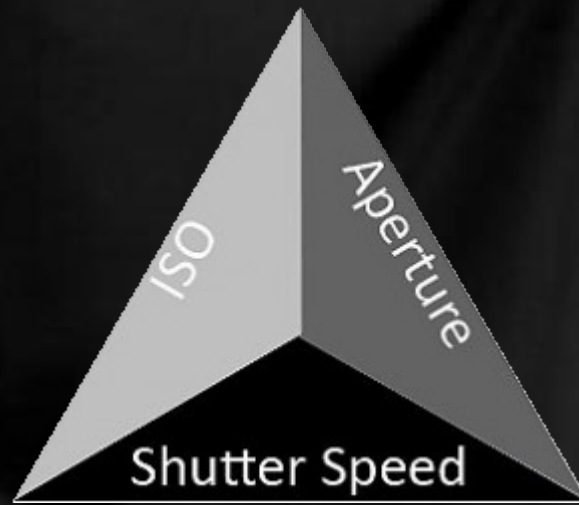
- ▣ is the size of the opening in the lens that the light goes through when a picture is taken
- ▣ the bigger the aperture, the more light gets in
- ▣ the smaller the aperture, the less light gets in
- ▣ the area of the opening determines the amount of light that gets in
- ▣ twice the area, twice the light
- ▣ half the area, half the light

# ISO

- ▣ is an acronym unrelated to what it describes
- ▣ is an acronym that is not even accurate
- ▣ is an acronym of “International Organisation of Standardisation”
- ▣ ISO is actually a measure of the sensitivity of the image sensor
- ▣ the greater the sensitivity, the less light needed for the photograph

# How are shutter speed, aperture and ISO interdependent?

- ▣ if you change one setting, another has to be changed so the EV stays the same



So we use the Exposure Triangle to produce an image with the correct EV (just like “Auto”)

but we control the settings to produce the effect we desire

# Numbers

- ▣ shutter speed, aperture and ISO are expressed in different ways – all using numbers
- ▣ shutter speed measures time in seconds, and uses numbers such as 2, 1,  $\frac{1}{2}$ ,  $\frac{1}{4}$ , etc.
- ▣ aperture measures diameter and uses numbers in the form of f/stops such as f/1.4, f2, f/2.8, f4 etc.
- ▣ ISO measures sensor sensitivity and uses numbers such as 25, 50, 100, 200 etc

# So how are the numbers related?

- ▣ in the old days before digital cameras, all the shutter speed settings differed by a factor of 2

- when you clicked the shutter speed dial up or down, the shutter would let in twice as much light or half as much light



# So how are the numbers related?

- in the old days before digital cameras, all the aperture settings differed by a factor of 2
- when you clicked the aperture ring on the lens up or down, the amount of light that was let in doubled or halved



# So how are the numbers related?

- ▣ in the old days before digital cameras, the ISO was determined by the sensitivity (speed) of film that you were using
- ▣ ISO was called ASA
- ▣ but the numbers are basically the same
- ▣ if the ASA number was doubled, the film sensitivity was doubled, just like ISO today
- ▣ so ISO 200 is twice as sensitive as ISO 100
- ▣ and each doubling is known as a stop



# Stops

- ▣ in the old days, when you turned the aperture dial to the next setting, it would click into place and “stop”
- ▣ when you turned the shutter speed dial to the next setting, it too would click into place and “stop”
- ▣ so any change from one setting to the next - which changed the amount of light by a factor of 2 became known as a stop

# How do we know what settings to use?

- ▣ take note of one little pointer ...



# How do we know what settings to use?

- ▣ it does not matter what shutter speed, aperture or ISO you use, as long as that little pointer points to “0” you will produce a photograph with the “correct” exposure (\*lv)
- ▣ so why do we need to know all that other stuff?
- ▣ because exposure isn't everything ...

# Exposure isn't everything?

- ▣ changing the ISO, aperture or shutter speed not only affects the exposure, it also has profound effects on the photograph you take

ISO	Shutter Speed	Aperture
200	1/8	f/32
200	1/15	f/22
200	1/30	f/16
200	1/60	f/11
200	1/125	f/8.0
<b>200</b>	<b>1/250</b>	<b>f/5.6</b>
200	1/500	f/4.0
200	1/1000	f/2.8
200	1/2000	f/2.0
200	1/4000	f/1.4
200	1/8000	f/1.0

all these settings result in the same Exposure Value  
but the photos they produce will all be very different

# Before we choose our settings ...

- ▣ we need to know how changing the ISO will affect our photograph
- ▣ we need to know how changing the aperture will affect our photograph
- ▣ we need to know how changing the shutter speed will affect our photograph

# Basically ...

- ▣ changing ISO affects “noise”
- ▣ changing Aperture affects “Depth of Field”
- ▣ changing Shutter Speed affects “blur”



more noise  
6400

less noise  
100  
ISO

shallow focus  
f1  
APERTURE

more in focus  
f22

# Exposure Triangle

SHUTTER SPEED

less motion blur

1/4000 sec

2 sec

more motion blur

# Let's start with Aperture

- ▣ aperture affects “depth of field” (DOF)
- ▣ DOF is defined as the distance between the nearest and farthest objects in a scene that appear acceptably sharp in an image.

# ISO

- ▣ increasing ISO increases “noise”
- ▣ in the old days “noise” was called “grain”
- ▣ both noise and grain are the result of less light being used for the exposure, but for two very different reasons
- ▣ grain was caused by a chemical process ...
- ▣ noise is caused by an electrical process
- ▣ the results look much the same



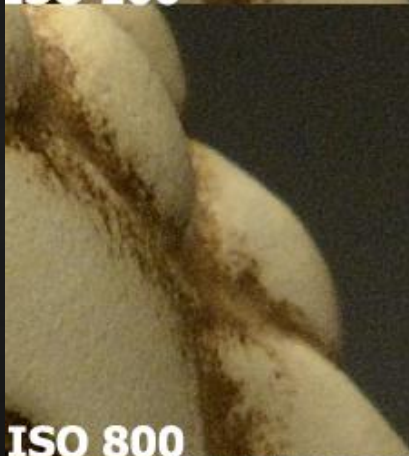
**ISO 100**



**ISO 200**



**ISO 400**



**ISO 800**



**ISO 1600**



**ISO 3200**



**ISO 6400**



**ISO 12800 (H1)**

# Shutter Speed

- ▣ fast shutter speeds help to freeze motion



# Shutter Speed

- ▣ slow shutter speeds can result in blurred images due to movement of the subject
- ▣ slow shutter speeds can also result in blurred images due to movement of the camera
- ▣ camera movement can be fixed by a variety of methods such as putting the camera on a solid surface; using a tripod, monopod or bean bag; holding breath, holding camera firmly etc.

## So ...

- ▣ to get exactly the photo you want ...
- ▣ you have to get off “Auto”
- ▣ There is no other way !!!



# Baby Steps ...

- ▣ Don't go straight from full Auto to full Manual
- ▣ Try using some of the "Auto Modes" first
- ▣ So what other "Auto Modes" are there ?

# Other Auto Modes

- ▣ **Portrait Mode**
- ▣ **Landscape Mode**
- ▣ **Sports Mode**
- ▣ **Night Mode**
- ▣ **Panoramic / Stitch Mode**
- ▣ **Snow Mode**
- ▣ **Fireworks Mode**
- ▣ **Kids and Pets Mode**
- ▣ **Underwater Mode**
- ▣ **Beach Mode**
- ▣ ... and the list goes on and on ...
- ▣ Our camera is telling us that using “Auto” will not produce the best images in all of the above situations !!!

# Using other Auto modes is great, but ...

- ▣ what if you want to take a portrait at night ...
- ▣ do you use Night mode, or Portrait mode ?
- ▣ what if you want to take a portrait of your kids in the snow, at night, holding fireworks, while skiing ... do you use ...
- ▣ Portrait mode or snow mode or night mode or fireworks mode or sports mode?

# Creative Auto Modes

There are 3 basic Creative Auto Modes

- Program Mode
- Shutter Priority Mode
- Aperture Priority Mode



# Creative Auto Modes

- ▣ **Program Mode (P)** - is similar to Auto but gives you a little more control over some other features including flash, white balance, ISO etc

# Creative Auto Modes

- ▣ **Program Mode (P)** - is similar to Auto but gives you a little more control over some other features including flash, white balance, ISO etc
- ▣ ... but it is basically a glorified Full Auto mode

# Creative Auto Modes

- ▣ **Shutter Priority Mode (S or Tv)** - you select a shutter speed and the camera then chooses all the other settings (aperture, ISO etc.)
- ▣ For example when photographing moving subjects you might want to choose a fast shutter speed to freeze the motion, or blur a subject like a waterfall by choosing a slow shutter speed.



# Creative Auto Modes

- ▣ **Aperture Priority Mode (AV)** – you choose the aperture and your camera chooses the other settings (shutter speed, ISO etc)
- ▣ Aperture priority mode is useful when you're looking to control the depth of field in a photo

# Going to full manual !

- ▣ when shooting in full manual mode, you should think like you are using one of the creative auto modes
- ▣ if the shutter speed is a priority, set and forget the shutter speed, and just adjust the aperture values to get the correct EV
- ▣ if you run out of aperture settings, adjust the ISO
- ▣ if you run out of ISO settings, you will have to rethink the shutter speed that you would like to use

# Going to full manual !

- ▣ if the aperture is a priority - set and forget the aperture and just adjust the shutter speed
- ▣ “aperture priority” full manual is arguably the better of the two options, as there are lots more shutter speeds to choose from than apertures
- ▣ if the shutter speeds gets too slow, use a tripod
- ▣ or increase the ISO or both

# Summary

- ▣ Shutter speed – big number / big exposure time
- ▣ Aperture - big number / big depth of field
- ▣ ISO – big number / big sensitivity

# So what does it all mean?

- ▣ know how aperture affects depth of field
- ▣ know how shutter speed affects blur
- ▣ know how ISO affects noise
- ▣ know your camera
- ▣ read your camera manual \*
- ▣ try shutter priority or aperture priority mode
- ▣ then take the plunge and turn that dial to M

**You will not regret it !!!**

**The End**