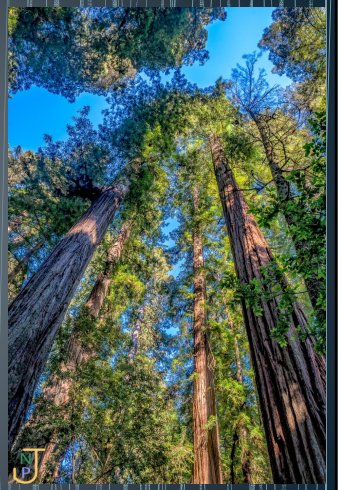
Mirrorless or Not?



Loren Nelson
www.NaturalPhotographyJackson.com

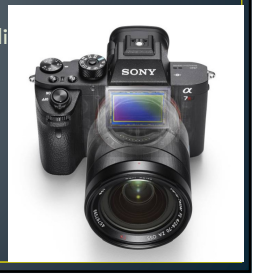
Learning Objectives

At the end of this session, you will be able to:

- List the common digital camera types used today
- Explain the difference between mirrorless and dSLR
- List advantages of mirrorless technology
- List the disadvantages of mirrorless technology
- Discuss real-life differences between technologies
- Apply knowledge to your *personal* camera selection

Camera Characteristics

- Type (phone, Point-and-shoot, super-zoom, mirrorless (MILC), Single lens reflex (dSLR)
- Brand
- Shooting modes – Auto, Program, A, S, Manual, Bulb
- Image capture - RAW or JPEG
- Sensor – size, pixels, resolution, sensitivity, di
- ISO range
- Shutter speed range
- Burst rate
- Other bells and whistles



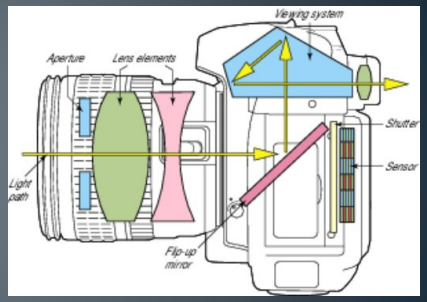
What is a MILC?

- **M**irrorless **I**nterchangeable **L**ens **C**amera
- Goal: smaller body like a point-and-shoot
- Ability to have multiple, high quality lenses
- Rapidly advancing technology
  - Leica M (range finder) – 2004
  - Micro 4/3 sensor - 2008
  - APS-C (crop sensor 1.5x) – 2010-2012
  - Full frame 24x36mm sensor – 2013/2014
  - High resolution sensor (42 megapixels) – 2015
  - Hasselblad (medium format) - 2016

Worldwide Sales
2013 – 5%
2015 – 26%

Why have mirrors been used?

- Light diverted to focus / view screens
- Mirror retracts to send light to shutter
- Shutter opens to expose sensor
- Shutter closes
- Mirror retracts



1937 – 1949 developed / 1960s popular

Vibrations

Why consider MILC?

- Smaller body
- Lighter weight
- Fewer mechanical parts / lower cost?
- No mirror flop / Vibration
- Improved image quality??

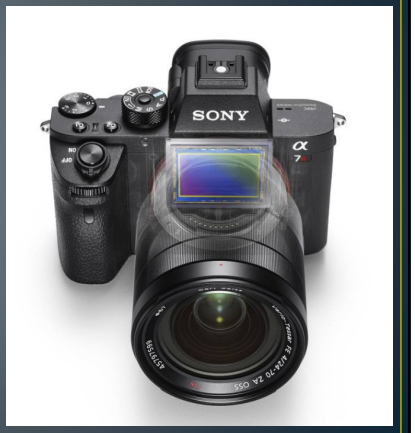
Size matters?

- Smaller = lighter
- Easier carry
- Less conspicuous
- Quieter

By Soe Lin

Top of the Line MILC?

- Introduced 2013 A7 line
- 2015 version 2 models
- Sony A7R2
- Full-frame
- High resolution sensor
- 5-axis stabilization
- Fast focusing
- Water / dust resistant
- "Professional" build
- Lens range expanding



Sony full frame lens issues

- E-mount lens or smart adapter to other mounts
- Only "full-frame" E-mount lenses will work
- Limited (17) lens selection – getting better
  - Primes – 28/2.0 – 85mm/1.4 ($450-1,800)
  - Zoom 24-70/2.8 to 70-300/4.5-5.6 ($1100-2600)
  - Zeiss (Planar, Distagon, Vario-Tessar, Sonnar)
- Quality comes at very high cost
- Third party options – still limited

What about lenses?

- New E-mount flange
- Limited initial offerings
- Limited initial quality
- Promises, promises
- Partnerships / variety
- Slow sales due to huge *other* lens investments
- Lens adapters
  - Slow / no autofocus
  - Metadata exchange
  - Exposure control
- Innovation by 3rd parties

Metabones IV

Size & weight comparison

	Sony A7R2	Canon 5D3	Canon 5D4	Nikon D810
Mega-pixels	42.4	22	30.4	36.3
Size	4.7x2.74x1.5	6x4.6x3	5.9x4.6x3	5.7x4.8x3.2
Weight (Oz)	20.53	30.3	28.6	31.4
Weight (g)	575	849	800	880
Metabones IV	5.3 (150 g)			
50mm/1.4*	778*	290	290	280
Total (50/1.4)	1503* / 1015	1139	1090	1160
24-70 2.8	886	805	805	900
Total (24-70)	1461 / 1530	1654	1605	1780
Cost ($)	3200	(2499)	3499	(2796)

Full frame comparisons

dSLR

- Larger body
- Heavier body
- Expensive
- Good/great sensors
- Optical viewfinder
- Fast autofocus

Mirrorless

- Smaller body
- Lighter body
- More expensive
- Amazing sensor
- Electronic viewfinder
- Slower autofocus

Autofocus technology

- Phase detection vs contrast detection autofocus
- dSLRs use phase detection autofocus
  - Special pixels on sensor
  - Very fast
- Mirrorless cameras use combination
  - Phase detection is very fast
  - Contrast detection is very precise
  - Combo is good but still *slower* than dSLRs

Electronic viewfinder

- "It's better than it used to be!"
- Shows image as seen by camera
- Great in dark / low light
- Manual focus-assist & focus peaking – great!
  - Focus assist automatically zooms in manual focus
  - Focus peaking show actual areas of best focus
- Must turn on camera / activate
  - Another delay
  - If you don't turn camera off between series of shots, battery life suffers greatly

Real-life shooting with A7R2

- *Amazing* resolution and dynamic range
- Amazing high ISO / low light capability
- Very short battery life!
  - About 100-150 shots / charge
  - Must turn off monitor and preview functions
  - Must turn off camera between shot series
- Huge raw file size (80mB/shot)
  - Fills buffer quickly in burst modes
  - Fills SD cards quickly – need larger / multiple cards
- Controls are very close together
  - Too easy to accidentally change settings
  - On/off switch on primary control wheel

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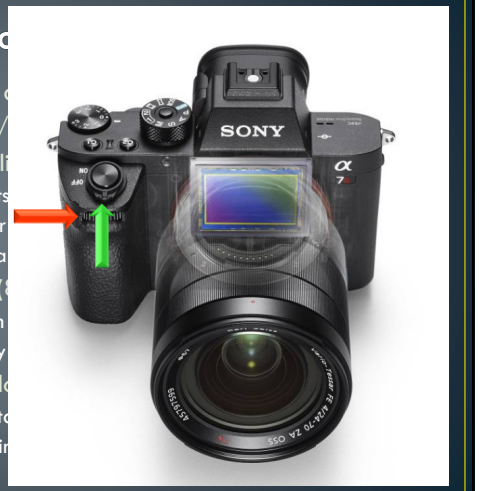

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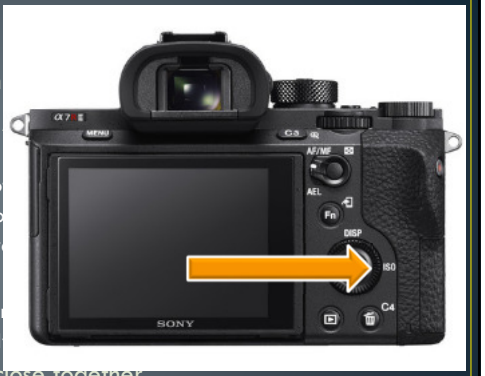

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Bells and whistles

- Lots and lots of bells and whistles!
- 4K (UHD) video
- Dual focus system Phase and Contrast detection
- Manual focus assist (magnification) and "Peaking"
- Zebras for blown highlights – variable sensitivity
- Tilting monitor screen
- Wifi, synch, share, and array of applications

Real-life shooting with A7R2 (2)

- Did I mention amazing resolution?
- Great dynamic range (~Nikon D810)
- Amazing low light / high ISO capability
- Slow and slightly inconsistent autofocus
- Slow burst rates (2.5 and 5 fps)
- NOT a sports or wildlife camera!
- Great landscape and portrait camera

Good autofocus speed
- Sony 28mm f/2
- Canon 17-40 f/4
- Canon 24-70 f/2.8
- Canon 70-200 f/2.8
- Canon 600 f/4 (+/- 1.4x)

Variable or slow autofocus
- Canon 100-400 f/4.5-5.6

Serious issues with A7R2

- Menus are a mess
- Auto exchange between view finder and monitor is erratic (at best)
- Small and close controls troublesome
  - On / off switch (used frequently!)
  - ISO setting
  - Exposure compensation
- Short battery life
- Single SD card
- Dust, dust, dust
  - Serious and poor auto-clean function

Mirrorless Key Points

- Camera types are selected according to use
- Technology is changing very fast
- MILC are smaller and lighter
- Lenses are still limited and expensive
- Very high image quality is possible
- EVF requires ***major*** getting used to
- Short battery life and high memory demands
- Dust and water resistance can be critical