Sony a7iii Camera Kit Introduction Workshop

Thrown together by David Tamés

v.0.1 September 29, 2021

(Revision 1.0, August 30, 2023)

This presentation is a work-in-progress. If you have any comments or suggestions for improvement, please email them to d.tames@northeastern.edu

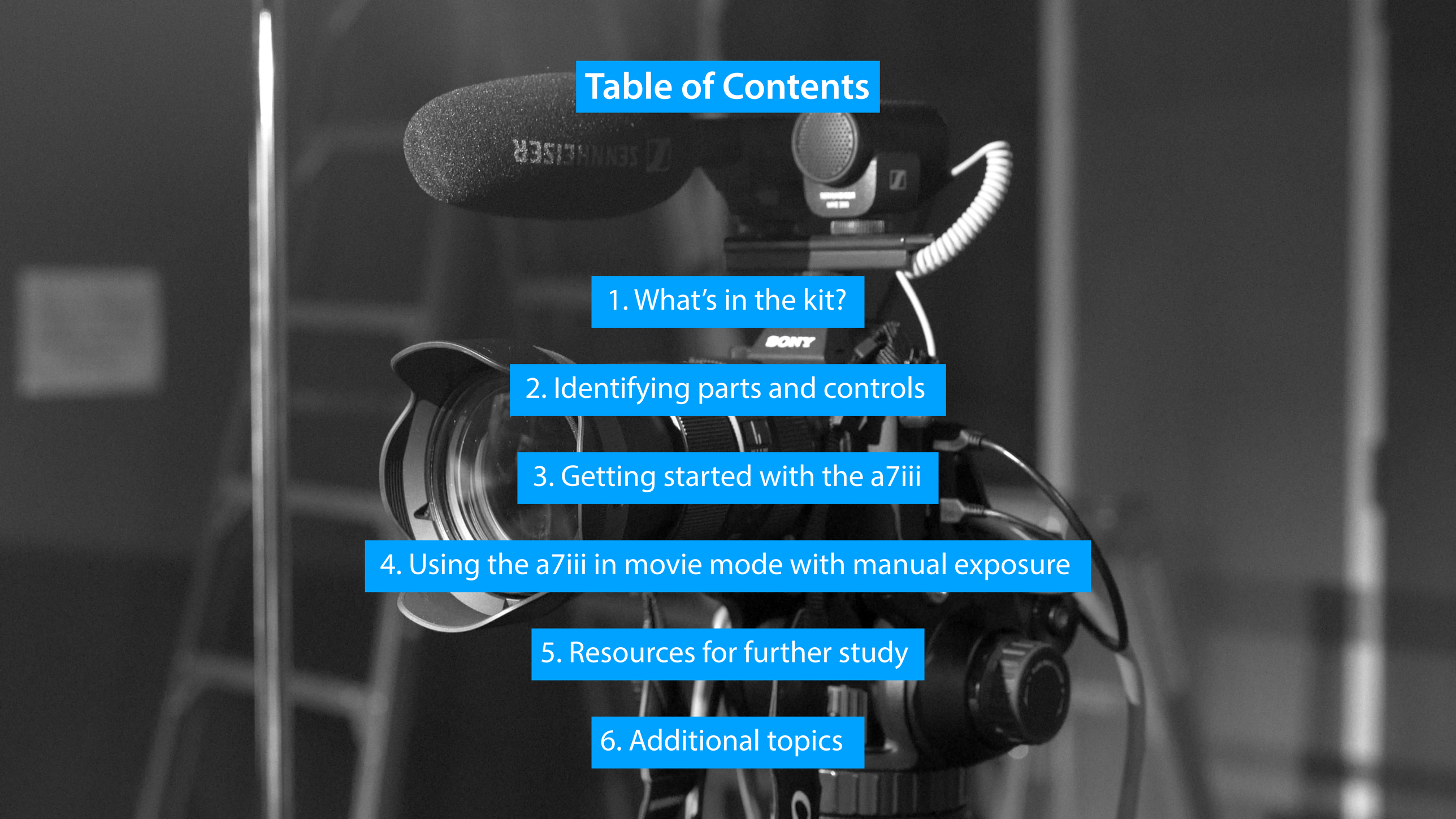


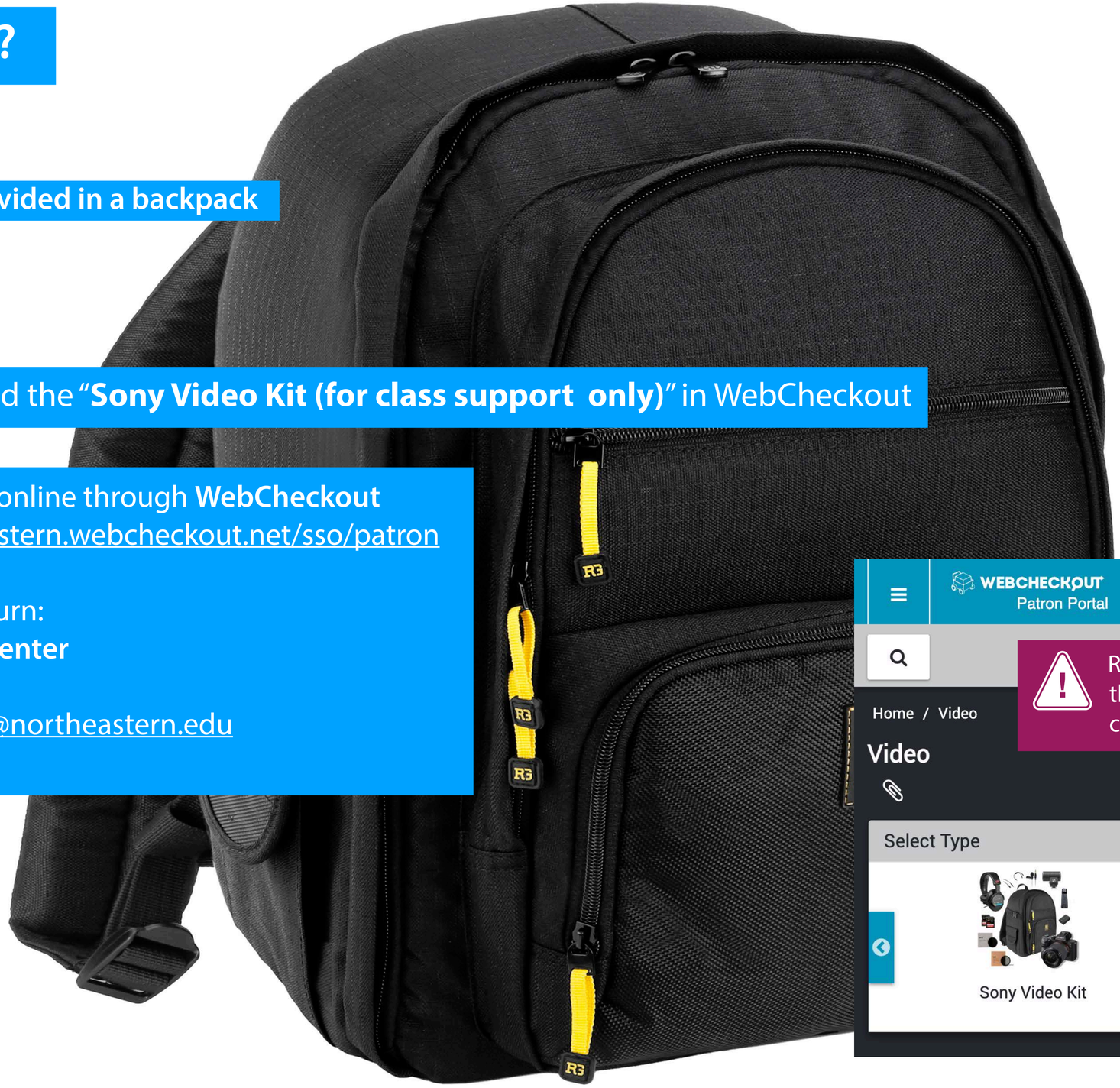
Table of Contents

Sony a7iii Camera Kit Introduction Workshop

1. What's in the kit?

What's in the kit?

The complete kit is provided in a backpack

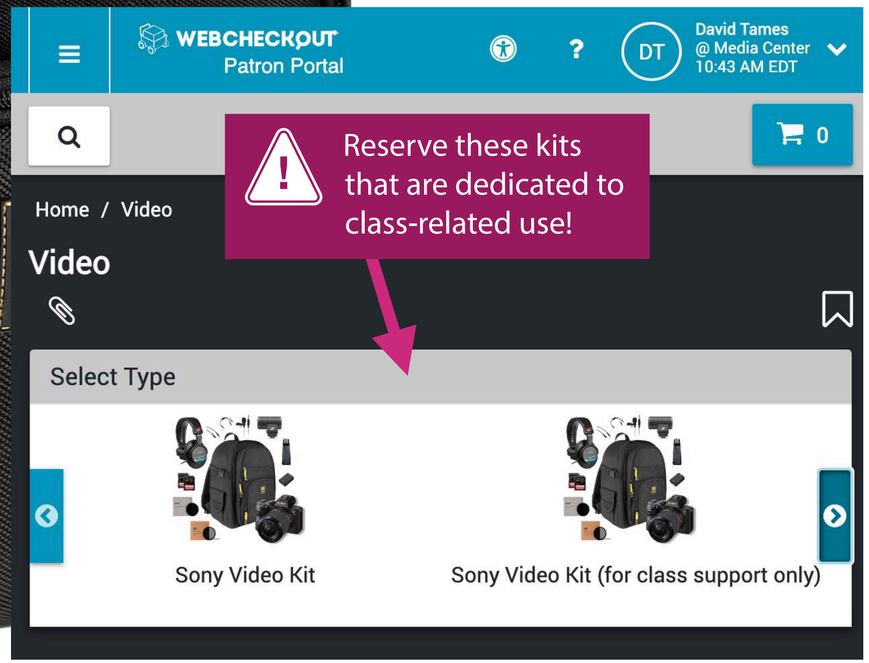


Go over the kit and make sure it is complete when you check out the gear. Doing a camera test prior to shooting is also highly recommended.

This kit is called the "**Sony Video Kit (for class support only)**" in WebCheckout

Reserve the kit online through **WebCheckout**
https://northeastern.webcheckout.net/sso/patron

Pick-up and return:
CAMD Media Center
Ryder 236A
camdmediactr@northeastern.edu
617.373.8697



Basic camera support available from the CAMD Media Center

Video tripods w/ fluid heads provide a stable base for the camera and offer drag adjustment for tilt and pan for silky pan and tilts

Manfrotto Video Tripod System Medium

Sachtler flowtech Carbon Fiber Video Tripod system

Monopods can be used for more stable hand-held work (techniques will be covered in the second camera workshop)

Manfrotto MVM450A Monopod Large

Vanguard VEO 2 AM-264TR Aluminum Monopod Small

⚠ Your hands should never leave the monopod unless it is resting stable on it's side, the camera on the monopod is not stable on the legs even if it seems so!

⚠ Always go over the gear and make sure it is complete and working properly before you leave the CAMD Media Center!

Manfrotto Video Tripod System Large

Sachtler Flowtech is is a professional fluid head and sticks combination that is larger and more stable than the medium video tripod; these are the best tripods we have in house!

Manfrotto LARGE Video Tripod works well except for one thing: The SIGMA Zoom lens interferes with sliding the camera on and off the head unless a riser is installed.

What's in the kit?

Sigma 24-70mm f/2.8 zoom lens

Sony a7iii full frame camera

Features

- 24.2 MP 35mm **Full-frame CMOS sensor**
- Sony E-Mount (wide selection of lenses available)
- ISO **sensitivity** up to 51,200 (6,400 usable limit)
- Excellent **auto focus** including touch AF
- **HD** or **4K** video recording
- 8 bit color linear or log recording, picture profiles
- Dual media slots (one slot is UHS-II compatible)
- 5-axis in-body **image stabilization**
- USB Type-C (USB 3.1) for power and control
- HDMI video out (micro connector)
- 3.5mm microphone input w/ plug-in power
- 3.5mm headphone output

Use the camera strap in order to avoid dropping the camera (unless using it on a gimbal)

What's in the kit?

Sigma 24-70mm f/2.8 zoom lens

- Lens cap
- Lens hood
- UV filter (82mm)
- Rear cap

Sony a7iii full frame camera

- 2 SDHC Cards (32GB or 64GB)
- 2 Sony camera batteries
- USB-C to USB-A Cable
- USB AC adapter
- Camera shoulder strap (not shown)
- Body Cap

What's in the kit?

Sigma 24-70mm f/2.8 zoom lens

- Lens cap
- Lens hood
- UV filter (82mm)
- Rear cap

Filter kit (82mm)

- Tiffen Circular Polarizer
- URTH ND8 (3 Stop)
- URTH ND64 (6 Stop)
- URTH ND1000 (10 Stop)

Sony a7iii full frame camera

- 2 SDHC Cards (32GB or 64GB)
- 2 Sony camera batteries
- USB-C to USB-A Cable
- USB AC adapter
- Camera shoulder strap (not shown)
- Body Cap

> If you are not familiar with lens cleaning, make sure to ask for a quick tutorial from Media Center staff or your instructor. Never touch or attempt to clean the sensor by yourself, seek help from the Media Center staff if you encounter problems with dust on the sensor.

Lens cleaning kit

What's in the kit?

Sigma 24-70mm f/2.8 zoom lens

- Lens cap
- Lens hood
- UV filter (82mm)
- Rear cap

Sony a7iii full frame camera

- 2 SDHC Cards (32GB or 64GB)
- 2 Sony camera batteries
- USB-C to USB-A Cable
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- Camera shoulder strap (not shown)
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Filter kit (82mm)

- Tiffen Circular Polarizer
- URTH ND8 (3 Stop)
- URTH ND64 (6 Stop)
- URTH ND1000 (10 Stop)

Rode Lavalier GO microphone

microphone extension cable

Sennheiser MKE200 microphone w/ windjammer

Sony MDR-7506 headphones

Lens cleaning kit

What's in the kit?

Keep anything you are not using in the bag to avoid losing it! Return all components to their original location (and pouch if applicable) when you are done using the kit.

Note: The backpack has a rain cover in the bottom outside pouch, this pulls out and slides over the bag to protect the contents in the event you have to carry the gear in the rain.

Sony a7iii Camera Kit Introduction Workshop

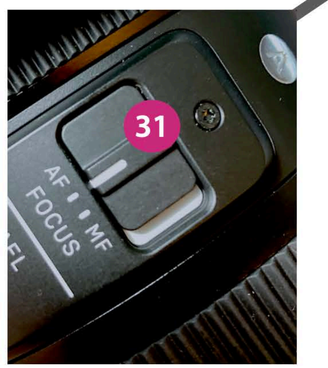
2. Identifying parts and controls

Identifying parts and controls

1. Viewfinder
2. LCD monitor (can tilt out)
3. Multi selector
4. AF-On (auto-focus activation)
5. AEL (auto-exposure lock) button
6. Movie record button
7. Multi-function dial
8. Play button
9. Menu
10. Custom buttons (C1, C2, C3, C4)
11. Multi-function select button
12. Function button
13. On/Off
14. Shutter release
15. Diopter adjustment
16. Program dial
17. Aperture/shutter speed dials
18. Exposure adjustment dial
19. Hot shoe / accessory mount

Identifying parts and controls

20. Sensor (do not touch!)
21. Lens release button
22. Hand grip
23. Microphone input
24. Headphone output
25. HDMI output
26. USB-C connector
27. Charging LED
28. USB multi-connector
29. Focus adjustment
30. Focal length adjustment
31. Auto-focus On/Off switch
32. Lens hood (removable)



Sony a7iii Camera Kit Introduction Workshop

3. Getting started with the a7iii

Getting started with the a7iii

1. **Insert SD Card***
2. **Insert Battery***
3. **Power on**

SD Card Requirements

- **SDHC/SDXC (Class 10, or U1 or faster)** works with
  - Any Photo Format
  - 4K Video 60 Mbps
  - HD Video 60 Mbps or lower
- **SDHC/SDXC (U3)** required for
  - 4K Video 100 Mbps
  - HD Video 100 Mbps

* CAMD Media Center cameras come with SD card and battery installed

Getting started with the a7iii

4. **Check battery level** (make sure you have at least 50% left on the battery, otherwise charge it or try using the second battery; it's a good idea to charge the batteries before your shoot)

Charging the battery

Power to charge the battery is provided by connecting the USB-A to Micro-USB cable between the AC adapter (both included in the kit) and the camera. Charging may also be done via the USB-C connection (a USB-C cable is not included in the kit).

LED indicates charging in progress

USB-C connector

Micro-USB connector

Getting started with the a7iii

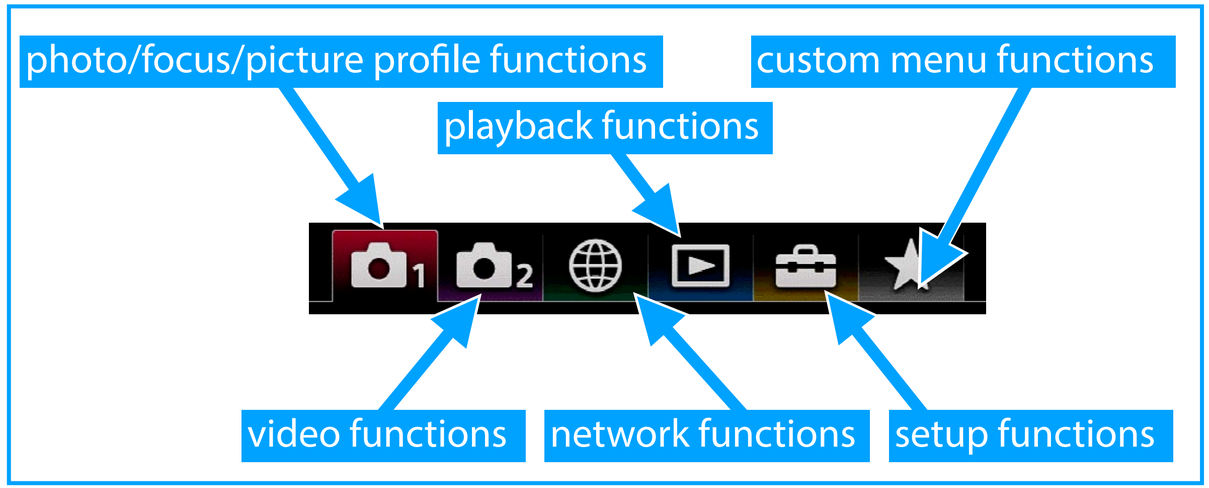
5. **Set mode to "P" for starters** (we will will work in Manual Movie mode later)

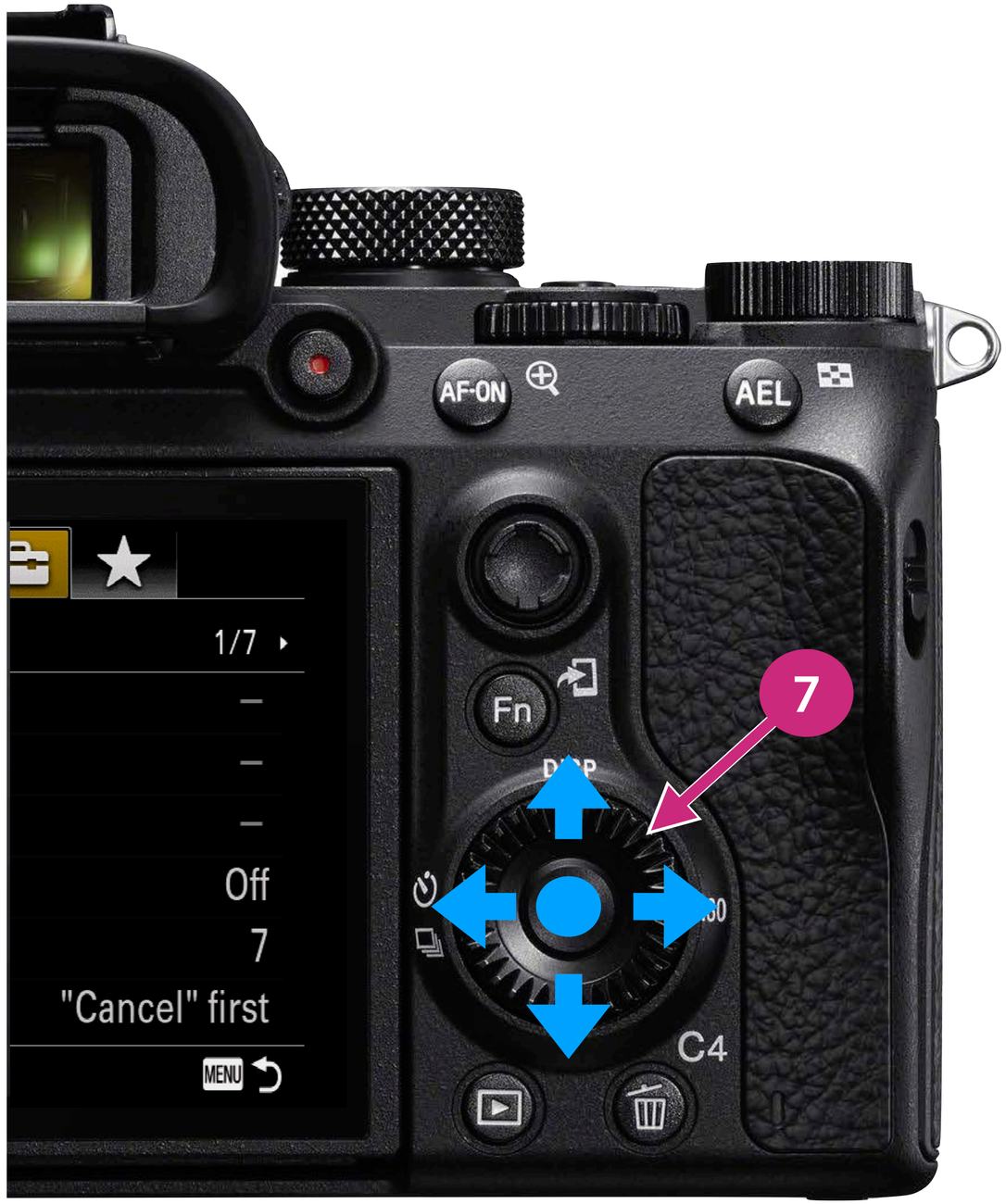
Program Auto

Aperture and shutter speed set automatically by the a7iii, while other settings can be adjusted manually

Getting started with the a7iii

6. Press “Menu” to **enter menu mode**
7. Use the **multi-function dial** to navigate and make selections with the multi-function button





Getting started with the a7iii

8. **Reset to "Factory Defaults"** so we're all working with the same configuration (Setup 7 => Settings Reset)

Getting started with the a7iii

9. **Set the date and time**
   (Setup 5 => Date/Time Setup)

Getting started with the a7iii

9. **Set the date and time**
   (Setup 5 => Date/Time Setup)

Getting started with the a7iii

10. **Format the SD card**
    (Setup => Setup5 (5/7) => Format), it will give you a choice of formatting Slot 1 or Slot 2

Note: If you have two cards installed, format both

Note: If using your own SD card, make sure whatever was on it before has been backed up

Note: You can configure the camera to save still images onto one card and videos on the other card (see manual)

Getting started with the a7iii

11. **Choose the File Format**
    For Stills/Photos:
    (Camera 1 => Quality/Image Size1 (1/14) => **File Format**

Getting started with the a7iii

11. Choose the File Format For Stills/Photos:

(Camera 1 => Quality/Image Size1 (1/14) => **File Format** => RAW or RAW & JPEG or JPEG

RAW

- Uncompressed image format
- Retains all of the data from the sensor
- Very large file sizes
- Superior processing capabilities in post

JPEG*

- Compressed image format
- Discards some of the data from the sensor
- Much smaller file sizes
- Limited processing capabilities in post

*JPEG (Joint Photographic Experts Group) is an industry standard image format for lossy and compressed image data with small file sizes ideal for sharing images efficiently with minimal storage and bandwidth requirements at the expense of quality.

Getting started with the a7iii

11. **Choose the File Format**
    For Video:
    (Camera 2 => Movie1 (1/9)
    => **File Format**)

Getting started with the a7iii

12. Choose the File Format For Video:

(Camera 2 => Movie1 (1/9) => **File Format**)

XAVC S / H.264 **HD**

- HD (1920 x 1080)
- Baseline production standard
- Less processor intensive than 4K
- Smaller files compared to 4K
- Less flexibility in post-production

XAVC S / H.264 **4K**

- UHD 4K (3840 x 2160)
- Higher end production standard
- More processor intensive than HD
- Larger files compared to HD
- More flexibility in post-production

Getting started with the a7iii

13. **Choose the Record Settings**
    For Video:
    (Camera 2 => Movie1 (1/9)
    => **File Format**)

Getting started with the a7iii

13. **Choose the Record Settings**
    For Video:
    (Camera 2 => Movie1 (1/9)
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Getting started with the a7iii

What is frame rate?

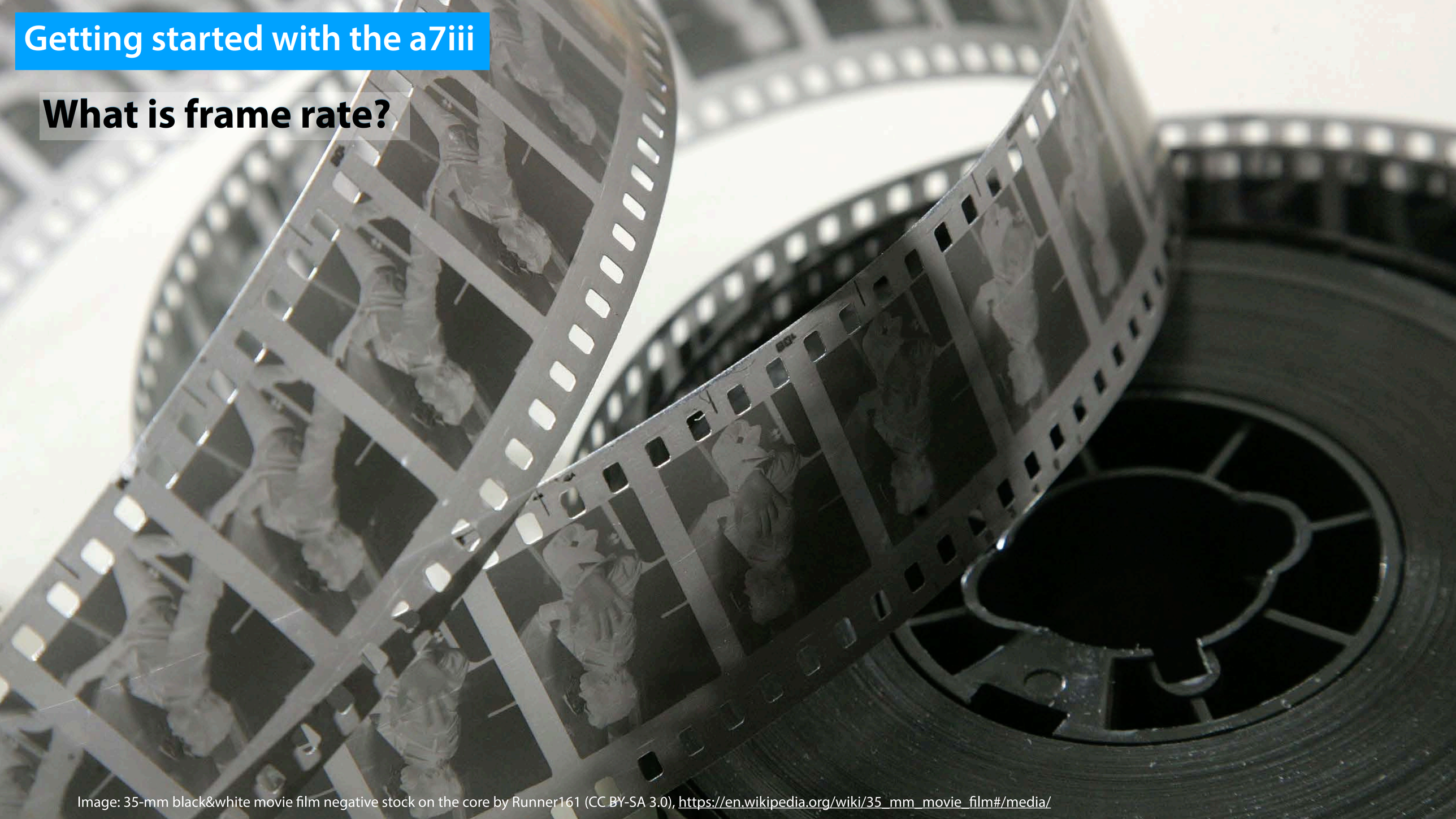

Image: 35-mm black&white movie film negative stock on the core by Runner161 (CC BY-SA 3.0), https://en.wikipedia.org/wiki/35_mm_movie_film#/media/

What is frame rate?

Frame rate (designated in frames per second or FPS) is the rate (frequency) at which consecutive frames (images) are captured by a camera or displayed by a playback system. While temporal sensitivity and resolution of human vision varies between individuals and depends on the characteristics of the visual stimulus, roughly, a frame rate above 12 or fps are required to perceive the individual frames as movement, and a frame rate above 24 or so fps are required for the movement to appear smooth.

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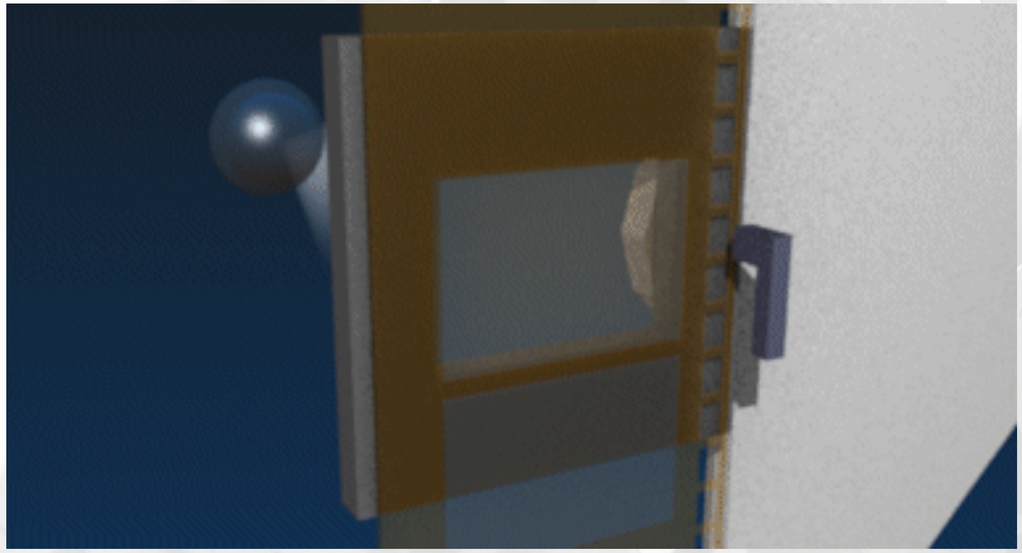

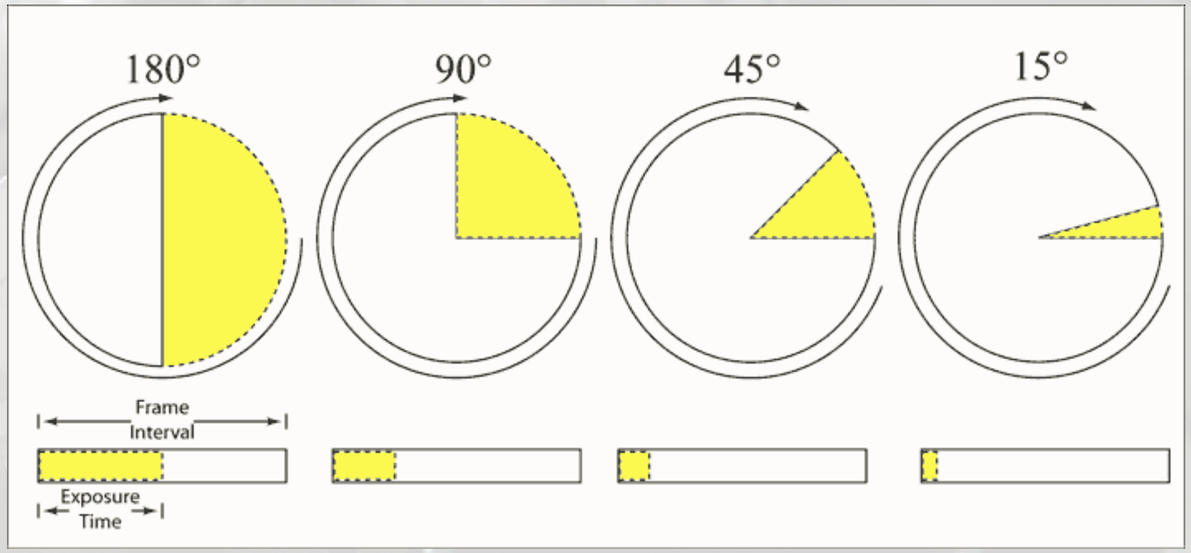

The cinema standard of 24 fps was a trade-off between smooth motion and film consumption. The standard 1/48 shutter speed is the result of a 180° rotating shutter. While the shutter blade covers the gate, the camera advances the film to the next frame. The frame is exposed while the shutter does not cover the gate. Higher shutter speeds are achieved by adjusting the shutter angle, with an effect on both exposure and motion blur, however, 180° became the standard and along with it motion blur of moving objects and/or camera movement due to 1/48 shutter speed, resulting in a major factor of the "film look."

Animation: Joram van Hartingsveldt (CC BY-SA 3.0), https://en.wikipedia.org/wiki/Rotary_disc_shutter#/media/File:Moviecam_schematic_animation.gif
Diagram: plowboylifestyle (CC BY-SA 3.0), https://en.wikipedia.org/wiki/File:ShutterAngle.png

Getting started with the a7iii

13. Choose the Record Settings For Video:

(Camera 2 => Movie1 (1/9) => **File Format**)

24p

- “film look”
- Motion blur
- Use 1/50 shutter* (a7iii can’t do 1/48)

30p

- “video look"
- Motion blur similar, but less than 24p
- Use 1/60 shutter*

60p

- “real look”
- Less motion blur
- Use 1/125 shutter* (a7iii can’t do 1/120)

120p

- “hyper-real look”
- Very little motion blur
- Use 1/250 shutter* (a7iii can’t do 1/240)

* P mode will adjust the shutter speed as needed to maintain proper exposure without considering standard shutter speeds for each frame rate, that’s why we eventually want to work in movie mode.

What is a video recording format?

A recording format (or file format) is a scheme for storing digital video and audio data. This almost always involves some form of compression to reduce the file size. The data file is structured with a container format (e.g. MP4) with the video data encoded using a coding format (e.g. H.264) along with the audio data encoded using an audio coding format (e.g. AAC). The container may also contain metadata such as title, date, and production data. The coded video and audio inside the container (not the metadata) is called the essence.

- Codec
- Data rate
- Resolution
- Frame rate
- Scan
- Color Sampling

Getting started with the a7iii

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- **Codec**
- Data rate
- Resolution
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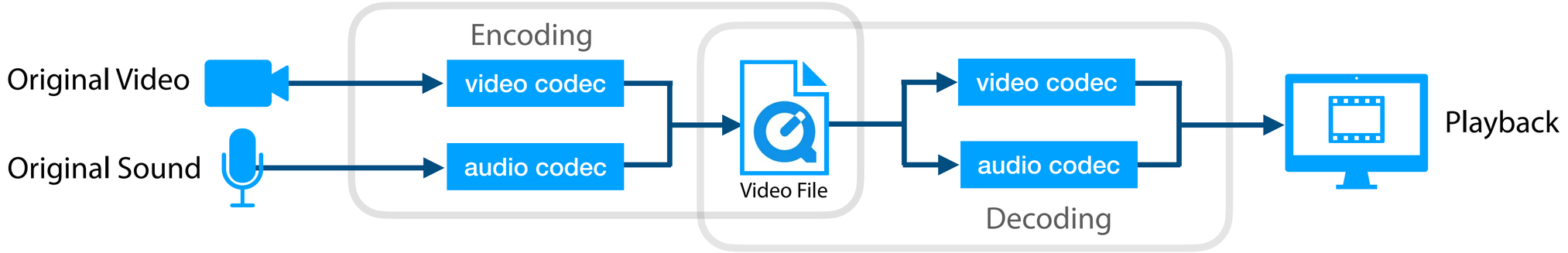
Codec. Software or hardware that can decode and encode compressed video or audio. Two major flavors: lossy or lossless (no loss of quality). Two key approaches: intra-frame (works on a per-frame basis, a.k.a. i-frame) and inter-frame (works across groups of frames, more efficient but with more artifacts). **H.264** is a lossy inter-frame codec widely-used for both acquisition and distribution (streaming). **Apple ProRes** is a virtually lossless intra-frame codec widely used in postproduction.

Bottom line: choose the highest quality codec your camera offers for acquisition of important work.



Getting started with the a7iii

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- Codec
- Data rate
- Resolution
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Data rate (a.k.a. bit-rate): The quantity of data per second of video or audio, often expressed megabits per second, or Mb/sec or simply M. For example, when using the XAVC S HD codec on the Sony a7iii at 24fps, the data rate is 50Mb/sec. This means that every minute of video will require 375.00 MB (megabytes) of storage (a byte is 8 bits).

Bottom line: choose the codec with the highest data rate for better quality if that is a priority for your work.

What is a video recording format?

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- Codec
- Data rate
- **Resolution**
- Frame rate
- Scan
- Color Sampling

Resolution: The size of an image, usually in pixels, e.g. high definition frame consists of 1920 pixels horizontally and 1080 pixels vertically. The term is also used to describe the amount of detail in an image, higher pixel resolution equals more detail.

Bottom line: choose the highest resolution your camera offers for the acquisition of important work. Shooting 4K when editing in HD provides flexibility in reframing shots.

Getting started with the a7iii

What is a video recording format?

A recording format (or file format) is a scheme for storing digital video and audio data. This almost always involves some form of compression to reduce the file size. The data file is structured with a container format (e.g. MP4) with the video data encoded using a coding format (e.g. H.264) along with the audio data encoded using an audio coding format (e.g. AAC). The container may also contain metadata such as title, date, and production data. The coded video and audio inside the container (not the metadata) is called the essence.

- Codec
- Data rate
- Resolution
- **Frame rate**
- Scan
- Color Sampling

Frame Rate: The number of individual frames per second (fps) recorded by the camera. 24p, 30p, 60p each provide a distinctive look due to the image refresh rate and motion blur, they offer creative options, it's not that one is better than the other (on the a7iii, use 24p w/ 1/50 shutter speed for a cinematic look, 30p w/ 1/60 shutter speed for a video look, and 60p w/ 1/125 shutter speed for a hyper-real look).

Bottom line: Choose the frame rate based on the look you want to achieve. For assignment in this class use 24p w/ 1/50 shutter speed unless you specifically want a different look based on creative choices.

What is a video recording format?

A recording format (or file format) is a scheme for storing digital video and audio data. This almost always involves some form of compression to reduce the file size. The data file is structured with a container format (e.g. MP4) with the video data encoded using a coding format (e.g. H.264) along with the audio data encoded using an audio coding format (e.g. AAC). The container may also contain metadata such as title, date, and production data. The coded video and audio inside the container (not the metadata) is called the essence.

- Codec
- Data rate
- Resolution
- Frame rate
- **Scan**
- Color Sampling

Scan: The scan may be progressive or interlaced. Progressive scan refers to recording or displaying lines (rows) of pixels progressively (1, 2, 3, 4, 5 ...) in contrast to interlaced scanning, consisting of two fields: the first field (lines 1, 3, 5, 7 …) and then a second field (lines 2, 4, 6, 8, …), this Interlaced video method with 60 fields per second (30 frames per second) is referred to as 60i and has lost dominance as progressive formats like 24p, 30p, and 60p offer higher image quality without interlaced artifacts. If your camera is capable of interlaced scanning, avoid it! The problem with interlaced scanning is illustrated in the CD / Interlacing video by Captain Delusion.

Bottom line: choose a progressive scan format if you have a choice between interlaced and progressive.

What is a video recording format?

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- Codec
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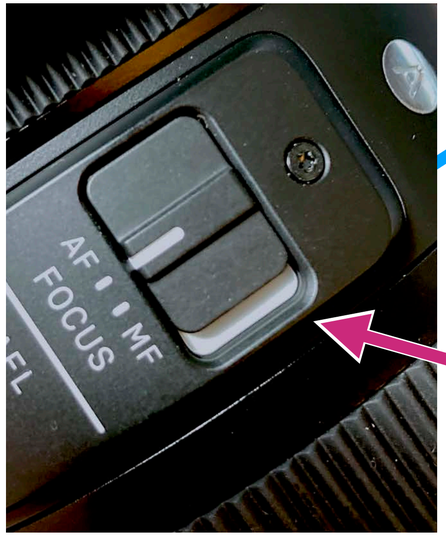
- Color Sampling

Color sampling: The reduction of color resolution in digital video in order to save storage and bandwidth. The color components are compressed by sampling them at a lower rate than the brightness (luminance). Since color information is discarded, processing the image during postproduction will reveal subsampling artifacts that include color noise and banding. In addition, the bit-depth is often reduced (e.g. the camera may perform 12-bit color processing internally, but will store color data using 8 bits in the recorded output).

Bottom line: If your camera offers a choice, select the best color quality settings in order to have have more flexibility when color correcting and color grading in postproduction.

Getting started with the a7iii

14. Set the lens to Auto Focus



14

Getting started with the a7iii

15. Enable continuous auto-focus

(Camera 1 => AF1 => Focus Mode: Continuous AF)*

- Pushing the shutter button half-way will trigger focusing if the scene is not focused as you would like it to be.

* This is just for starters, you will want to investigate the many auto-function options of the a7iii, but for now, we'll configure the camera for continuous auto-focus (this slide) and touch operation (next slide)

Getting started with the a7iii

16. Enable Touch Focus

(Setup => Setup2 => Touch Operation: ON)

Using touch focus

- During recording you can touch the area of the screen you want in focus, this will engage touch focus mode
- Press the multi-function select button to disengage touch focus andreutnr to continuous AF mode

Getting started with the a7iii

17. Set white balance to automatic (AWB)
(Camera 1 => Color/WB/Img. Processing (12/14) => White Balance: Auto)*

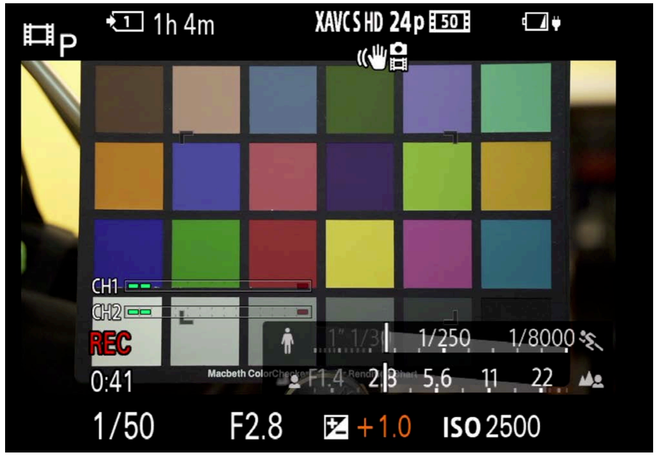
White Balance Options

AWB AWB AWB −1 0 +1 +2 WB AWB

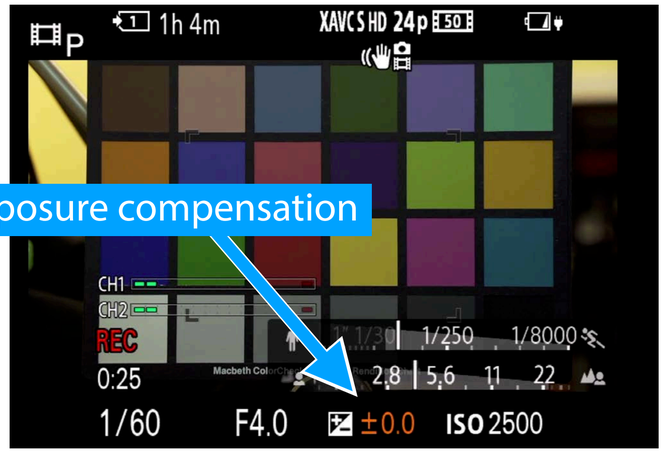
* This is just for starters, you will want to manually adjust white balance or set the white balance using a reference card in the scene whenever accurate color is required.

Getting started with the a7iii

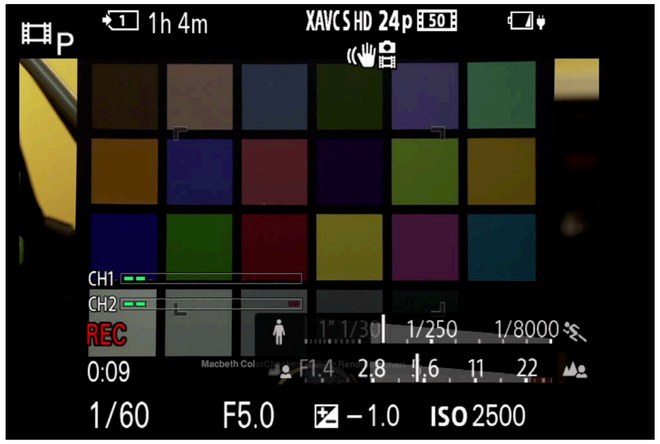
18. **Adjust for over- or under exposure using the Exposure adjustment dial In P mode** (the a7iii will automatically adjust aperture and shutter speed, but you have some control over exposure with this dial)



+ 1 stop adjustment



0 adjustment



- 1 stop adjustment

Getting started with the a7iii

19. **Adjust the focal length** of the lens as desired
20. **Take a photo or shoot video**
    a. **Fully press to take photo, press half-way to engage single-shot focus** with the shutter button button
    b. **Start and stop video recording** with the video record button
21. **Review your photos or video recordings** with the Play button

Getting started with the a7iii

22. **Adjust the ISO** by pressing the multi-function select button where it is marked "ISO" and then scrolling up and down*

* try to shoot with lower ISO ratings whenever possible since lower ISO settings exhibit less noise

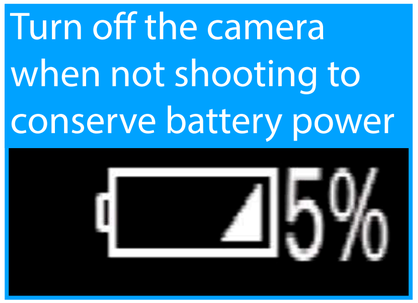
Getting started with the a7iii

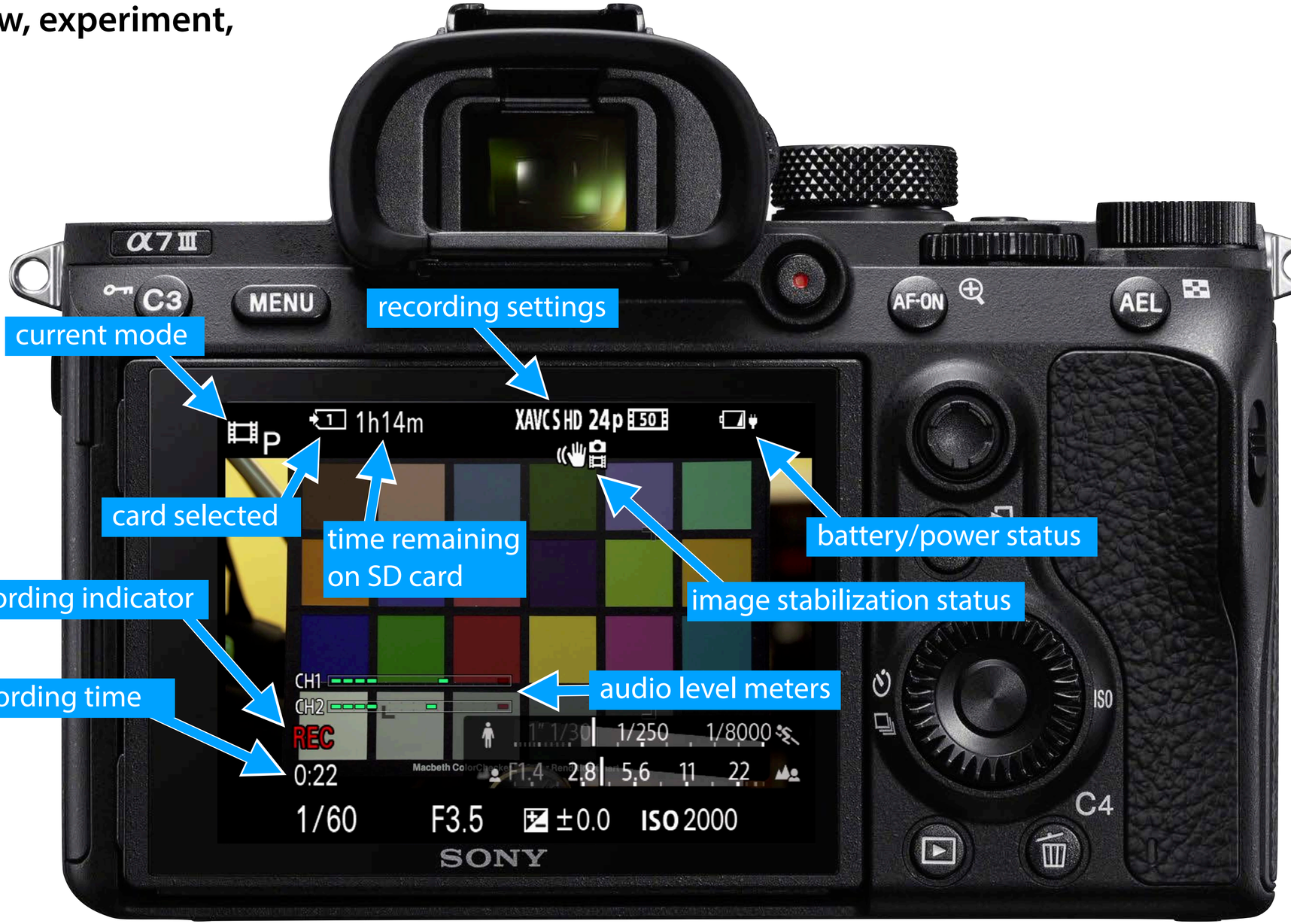
23. Record photos, video, review, experiment, and keep notes!

Notes:

- In P Mode audio levels are automatically adjusted when shooting video
- Image stabilization is enabled by default
- Camera may be powered via USB-C as well as battery
- Video recording in progress indicated by REC on the LCD, otherwise it is STBY

Turn off the camera when not shooting to conserve battery power





Getting started with the a7iii

hands-on activity — interpret these prompts any way you like, have fun!

For this workshop shoot HD/24p VIDEO in P mode w/ auto-focus; experiment with touch focus and exposure compensation.

Shot List (listed in the printed handout)

Getting started with the a7iii

24. Preparing to transfer your video files from the SD card to a computer (if connected to a computer when powered on, the camera will come up in USB Mass Storage Mode)

- You may also remove the SD card and use an SD card reader (this may be faster)

Always make a backup of important work.

Kits may have a data-only cable, therefore, use the SD card reader for media ingest!

USB-C connector

micro-USB connector

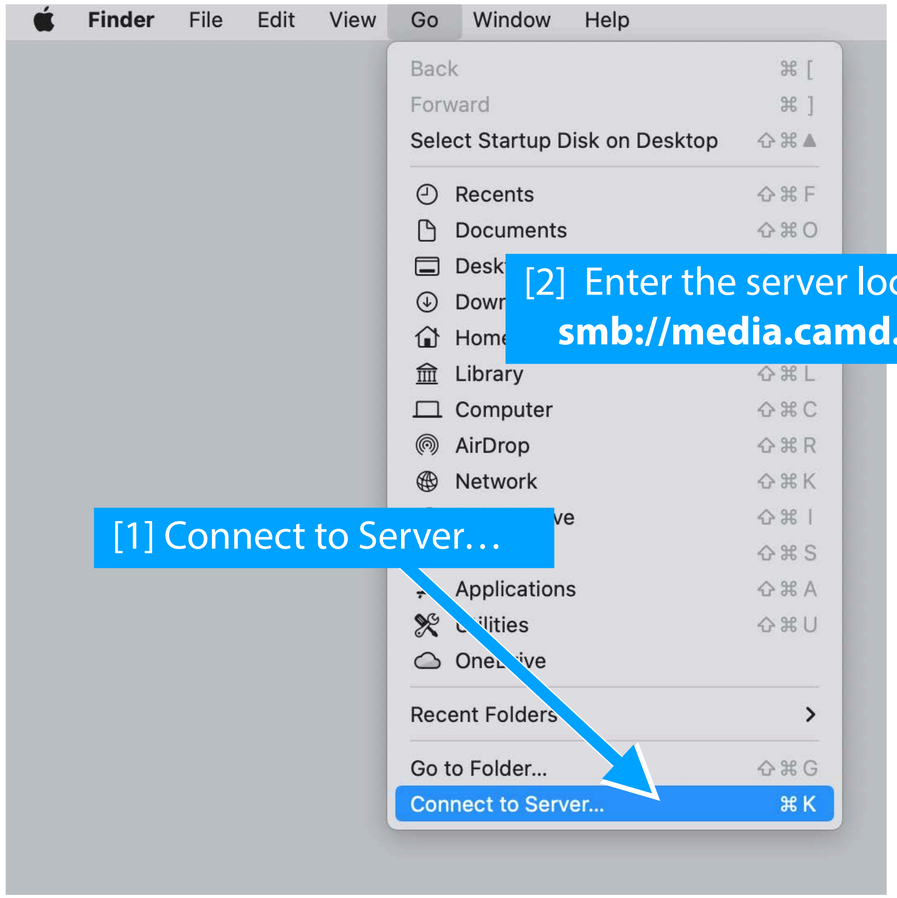
to computer (for data transfer) or power source (for charging the battery)

Getting started with the a7iii

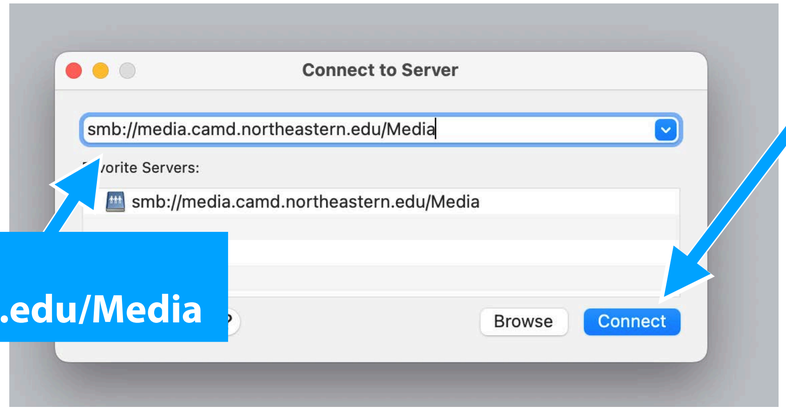
25. Transfer your video files from the SD card to a folder on your computer or a folder on the Shared Media Server

- It is a best practice is to copy the entire card to a folder in your folder on the shared server (in other words, make an **exact copy** of the card)

> ⚠ The server is not backed up! Always make a backup of important work.



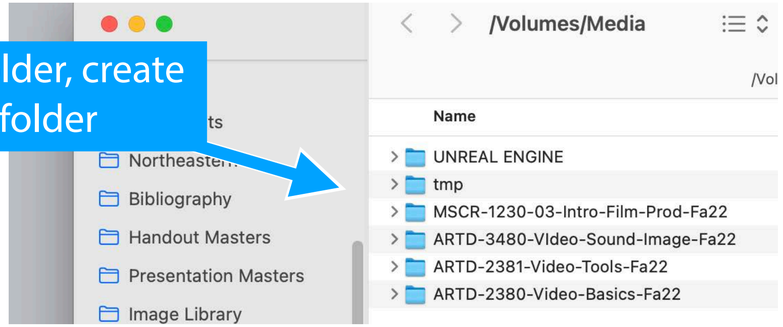
[1] Connect to Server…



[2] Enter the server location:
smb://media.camd.northeastern.edu/Media

[3] Connect and then authenticate with username and password listed in Canvas

[4] volume will appear on your desktop and/or appear as a mounted volume



[5] The class has its own folder, create your own folder inside this folder

If connecting with windows, the server location is: \\media.camd.northeastern.edu\Media

Getting started with the a7iii

25. It's a wrap! Now:

1. Power off the camera (format the card if you don't' want someone else coming upon your work)
2. Return all equipment and accessories to their respective pouch or compartment in the backpack
3. Wrap any long cables using over-under technique
4. Double check against kit inventory before closing bag kit is complete

Wrapping the MDR-7506 headphones

Please DO NOT WRAP THE COILED CABLE around the MDR-7506 headphones, simply fold the headphones, drop them into the pouch, and then drop the coiled cable on top of the headphones. Wrapping the cable around the headphones damages the cable!

NO!

YES!

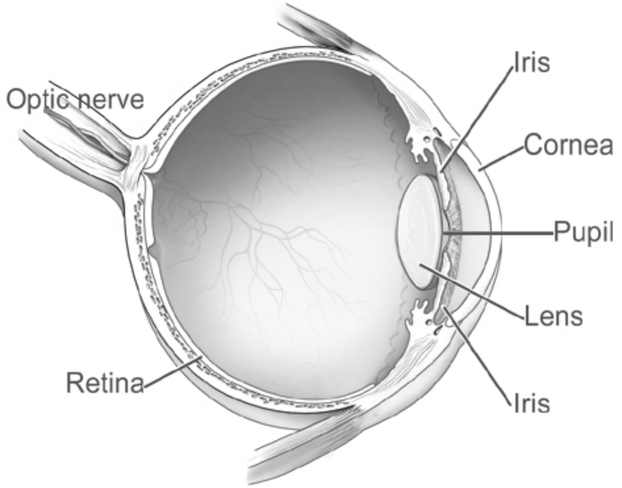
Treat all gear with care as as if it was animate and and it will return the favor

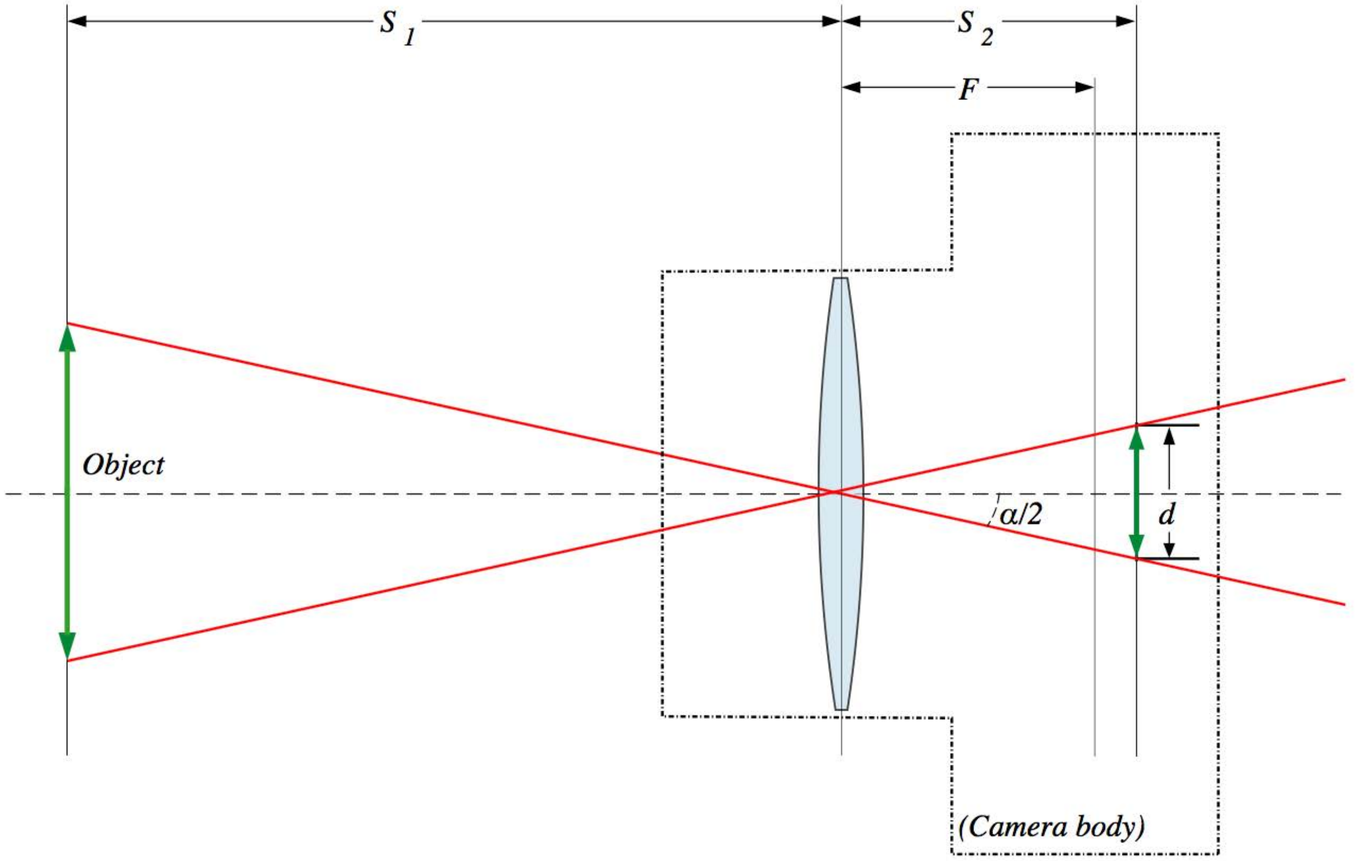
Sony a7iii Camera Kit Introduction Workshop

4. Using the a7iii in movie mode with manual exposure

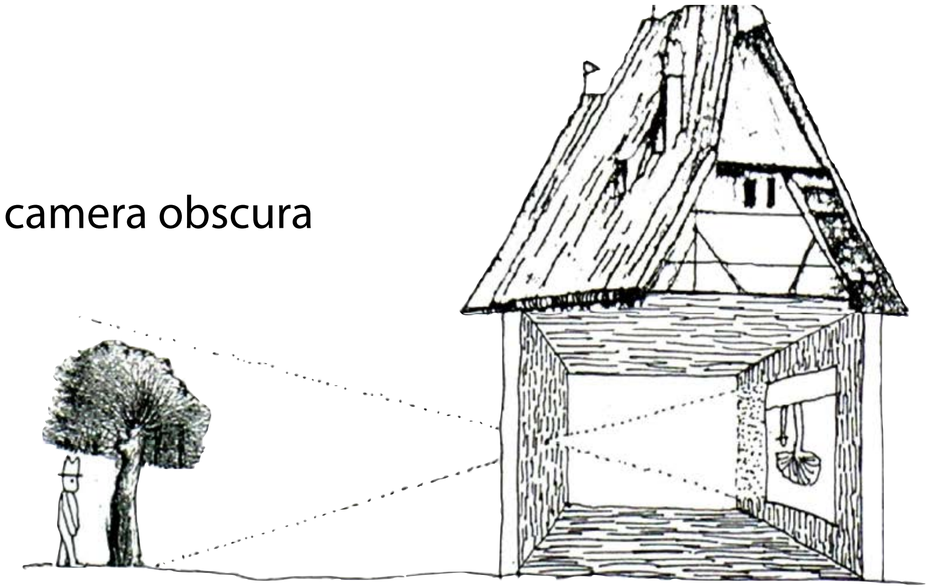
Using the a7iii in movie mode with manual exposure

What is a camera?





camera obscura

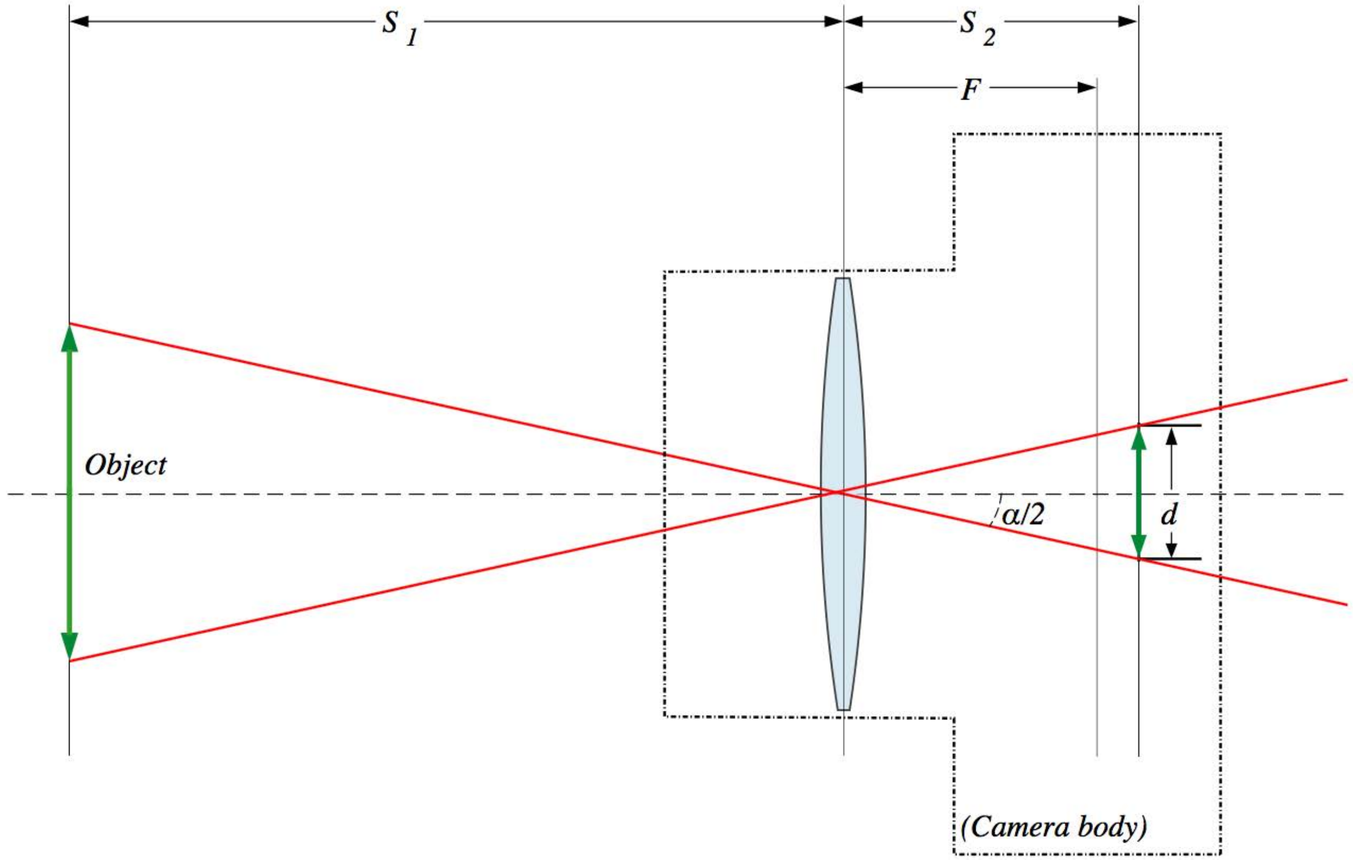


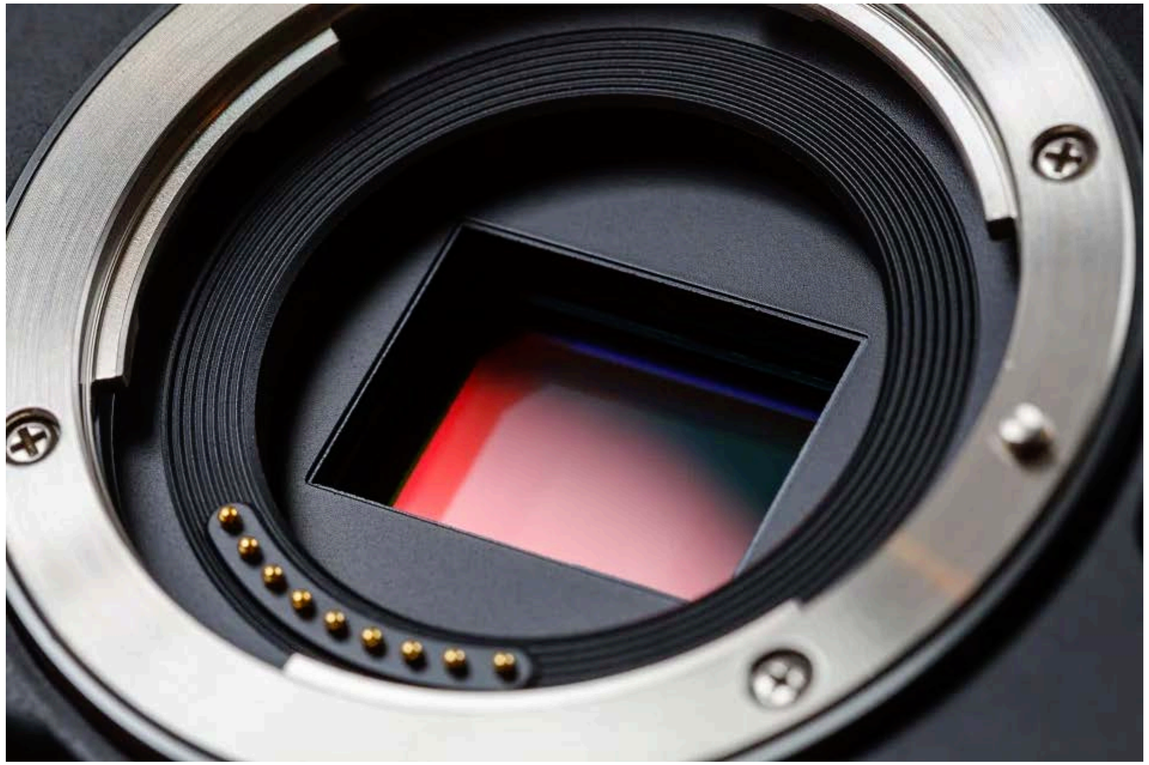
Camera image from Wikipedia, other images sources TBD

Aberlardo Morell: Camera Obscura- Manhattan View looking South in Large Room, 1996 © Aberlardo Morell, https://www.abelardomorell.net/camera-obscura

Using the a7iii in movie mode with manual exposure

What is a camera?





Camera image from Wikipedia

Using the a7iii in movie mode with manual exposure

1. **Set the camera to Movie Mode (a.k.a. Video Mode) by setting the mode dial to** 🎞

- In Movie Mode, aperture and shutter speed are set manually for complete creative control over the image

Leave this on 0, unlike program mode, now you'll be using manual control of aperture, ISO, and ND filters to control exposure (keeping shutter speed fixed at 1/50)

Using the a7iii in movie mode with manual exposure

2. Set the Exposure Mode to Manual
(Camera 2 => Movie1 (1/9) => Exposure Mode: Manual Exposure)

Exposure Modes

Manual
Aperture and shutter speed are set manually for complete creative control over the image

Program Auto
Aperture and shutter speed set automatically by the a7iii, while other settings can be adjusted manually

Aperture Priority
Adjust aperture manually (to control both exposure and focus range or background blur) and the a7iii will select the shutter speed automatically.

Shutter Priority
Adjust shutter manually (to control both exposure and motion blur) and the a7iii will select the shutter speed automatically.

Using the a7iii in movie mode with manual exposure

3. **Set resolution and frame rate** (just like we did in the Getting Started session)

   (Camera 2 => Movie1 => File Format: HD or 4K)

   (Camera 2 => Movie1 => Record Settings: 24p 50M)

Standards for this course:

XAVC S/H.264 HD or XAVC S/H.264 4K

- **HD** (1920 x 1080) or
- **UHD** 4K (3840 x 2160) for higher resolution

24p

- "film look"
- Motion blur
- **Use 1/50 shutter speed**

Using the a7iii in movie mode with manual exposure

4. **Enable Zebras to aid in exposure adjustment**
   (Camera 2 => Display/Auto Review1 (6/9) => Zebra Setting)

Using the a7iii in movie mode with manual exposure

4. **Enable Zebras to aid in exposure adjustment (Camera 2 => Display/Auto Review1 (6/9) => Zebra Setting)**

areas that exceed the exposure threshold you've set will have zebra stripes over them (in this case 90 IRE)

Using the a7iii in movie mode with manual exposure

4. **Enable Zebras to aid in exposure adjustment** (Camera 2 => Display/Auto Review1 (6/9) => Zebra Setting)

Luminance values

- **100** - White, no textural detail
- **90** - Brightest highlight area with textural details
- **70** - Highlight areas with textural detail
- **50** - Middle of the tonal scale (e.g. 18% grey)

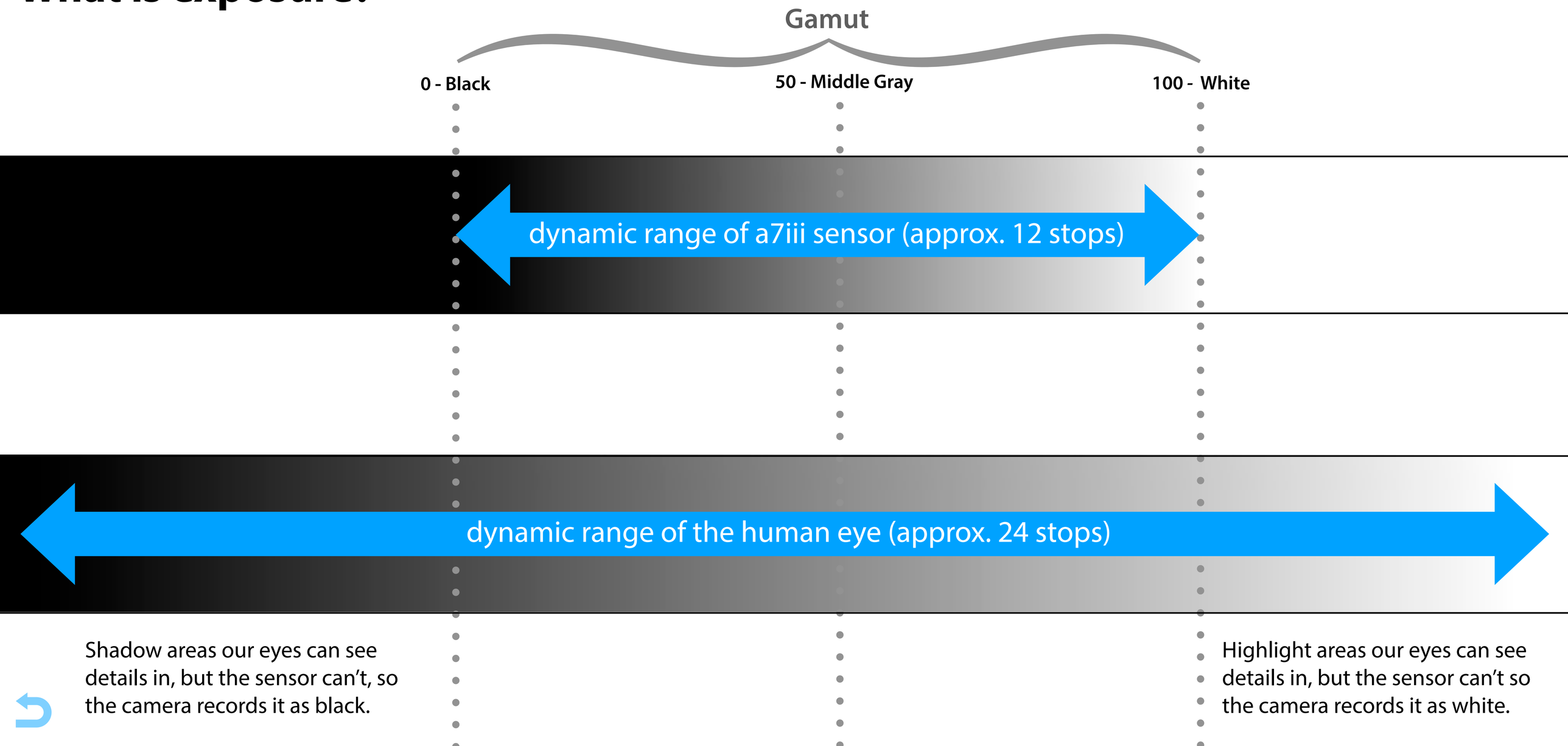
In this example, the Zebra is set to 85, and no zebras are showing, therefore, all elements of the scene are below 85 on the 0 (black) to 100 (white) luminance scale.

Using the a7iii in movie mode with manual exposure

5. **Now you have manual control over exposure** by adjusting: (a) the aperture dial, (b) the shutter speed dial (though you'll want to keep this at 1/50 for "normal" motion blur), and (c) ISO sensitivity via the multi-function dial

Using the a7iii in movie mode with manual exposure

What is exposure?

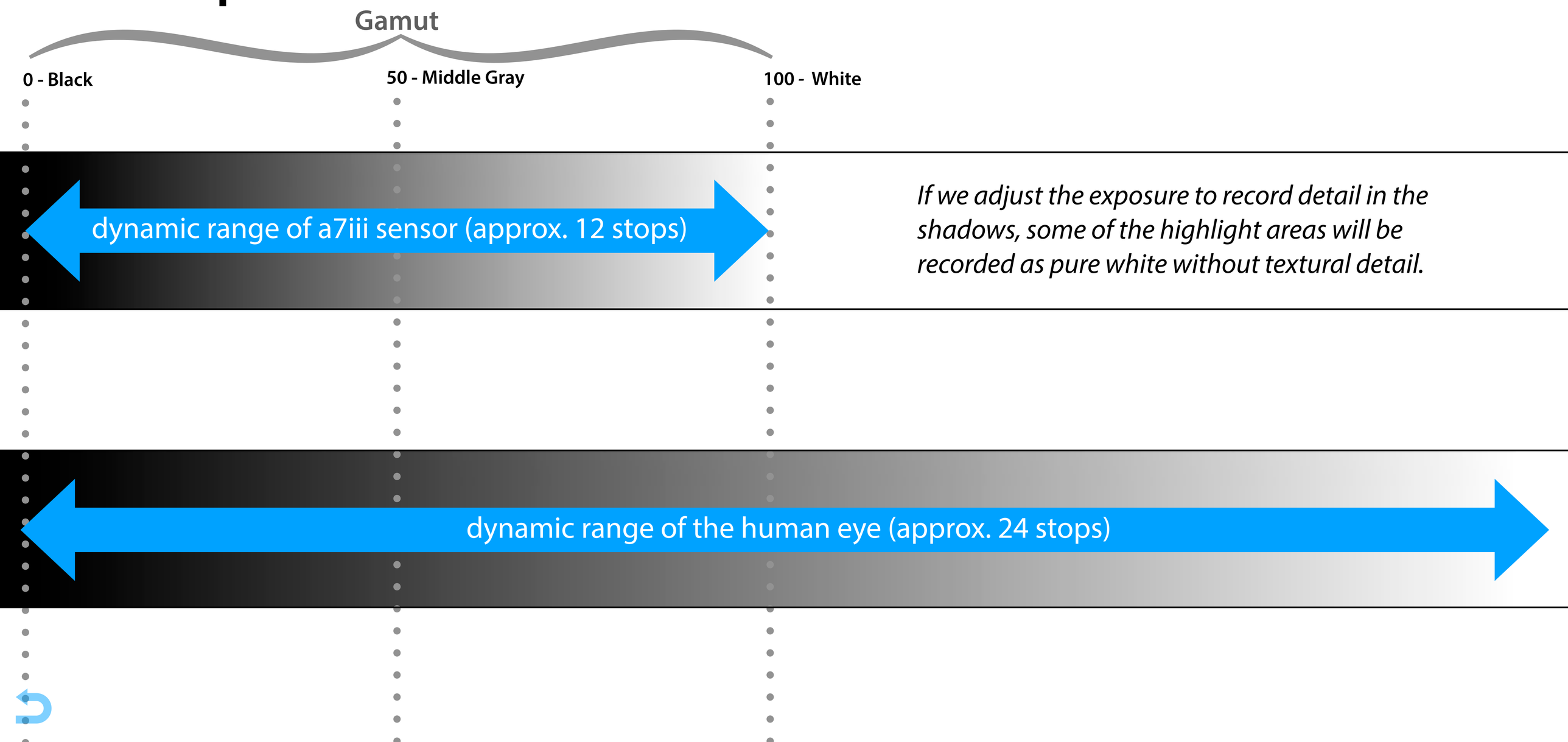


Shadow areas our eyes can see details in, but the sensor can't, so the camera records it as black.

Highlight areas our eyes can see details in, but the sensor can't so the camera records it as white.

Using the a7iii in movie mode with manual exposure

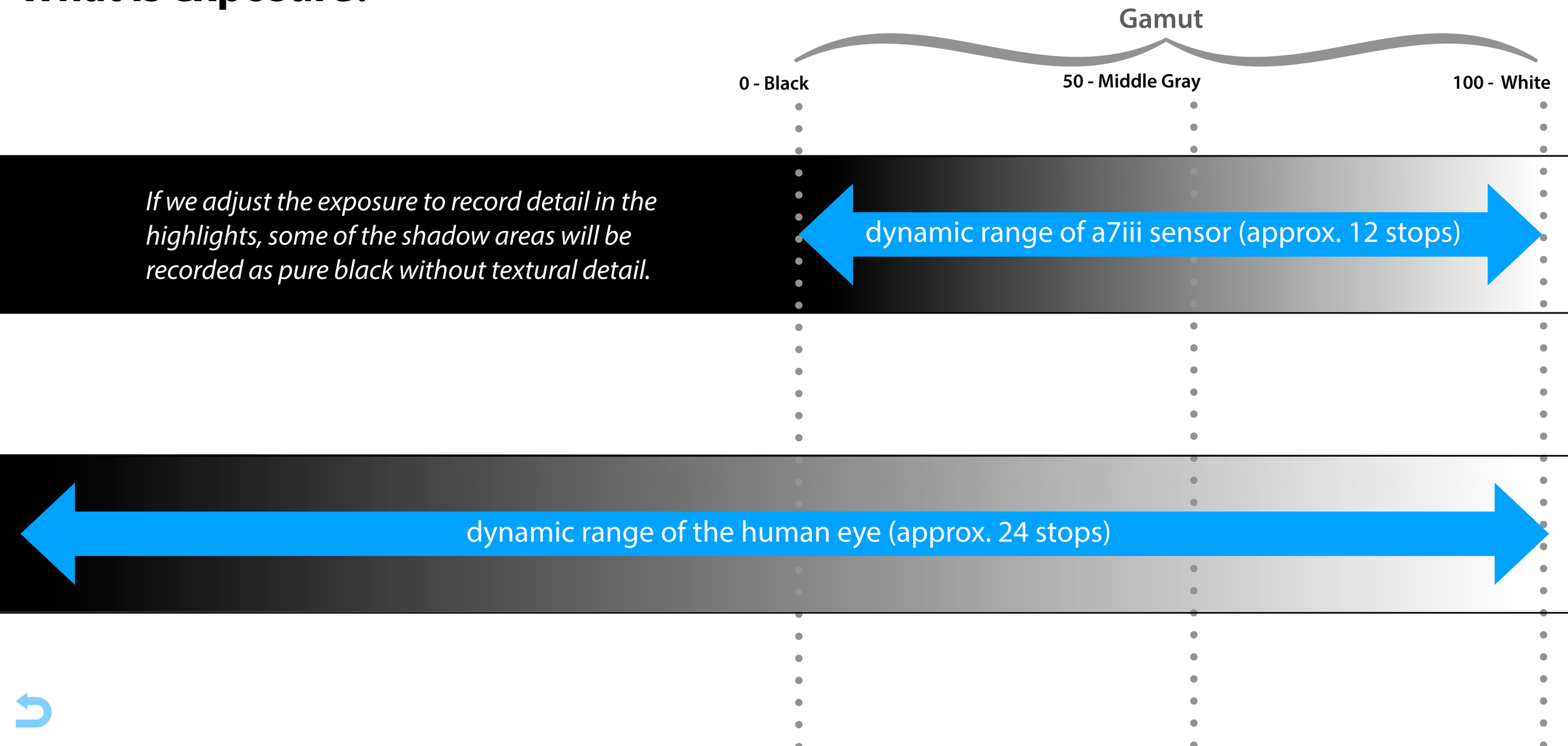
What is exposure?



If we adjust the exposure to record detail in the shadows, some of the highlight areas will be recorded as pure white without textural detail.

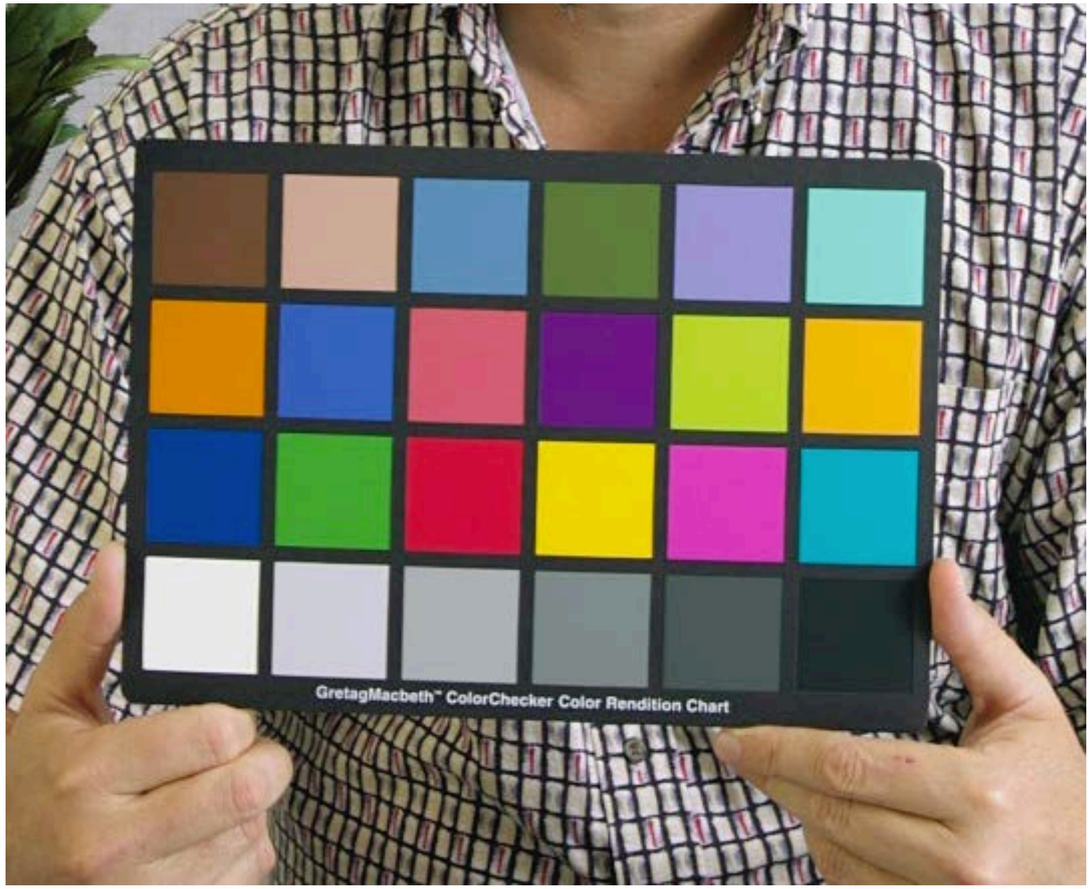
Using the a7iii in movie mode with manual exposure

What is exposure?



Using the a7iii in movie mode with manual exposure

What is good exposure?



(PD)

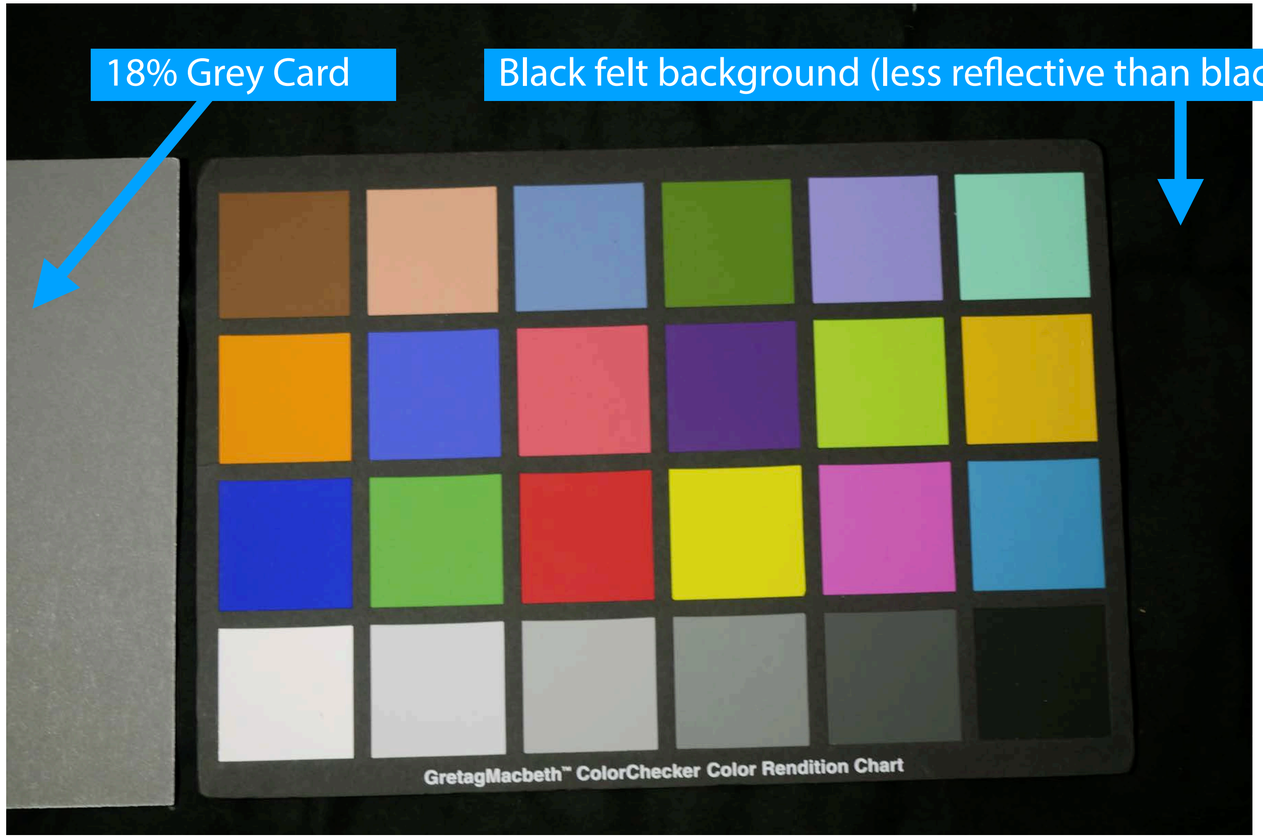
Software Support:

- Adobe Photoshop and Adobe Lightroom via a free plugin
- Black Magic Design DaVinci Resolve for color grading
- 3DLUT Creator
- and others

See also ColorChecker, https://en.wikipedia.org/wiki/ColorChecker
See Color Checker, Calibrite, https://calibrite.com/us/product/colorchecker-classic/

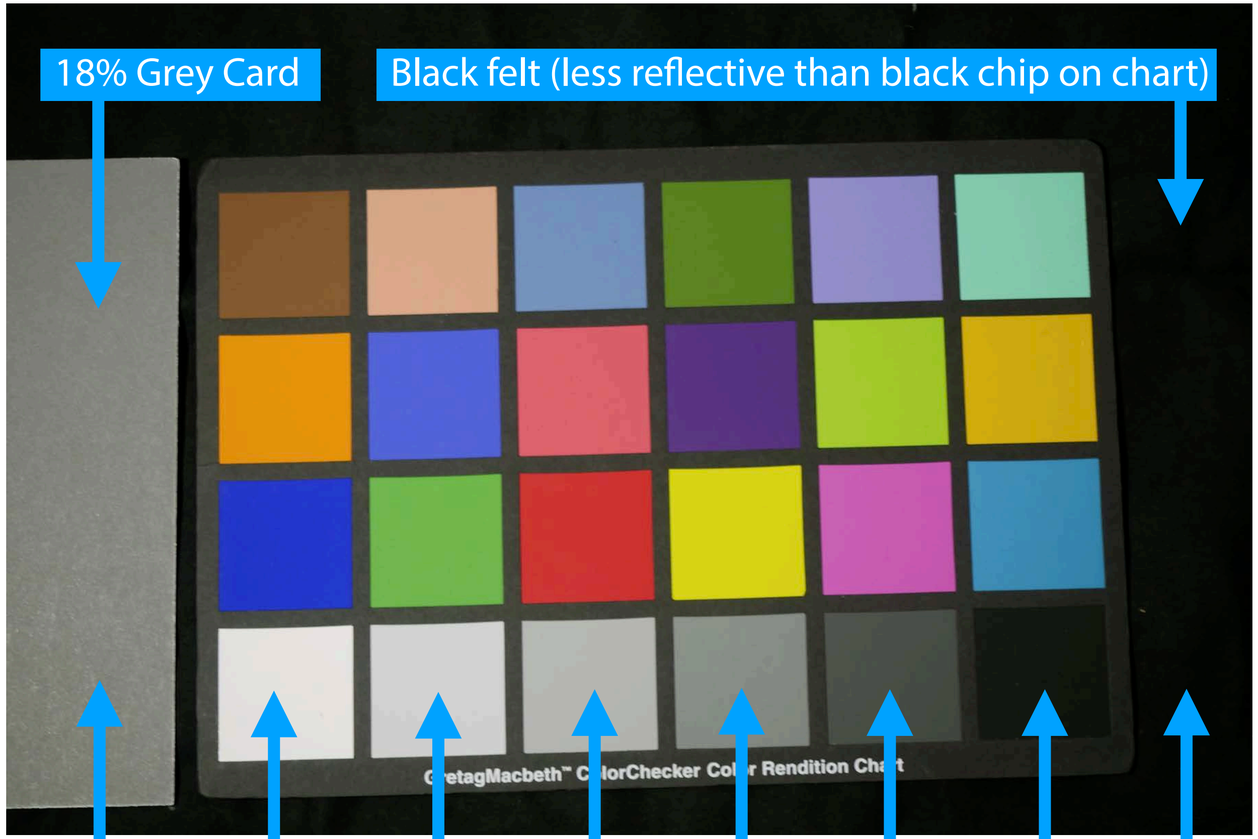
Using the a7iii in movie mode with manual exposure

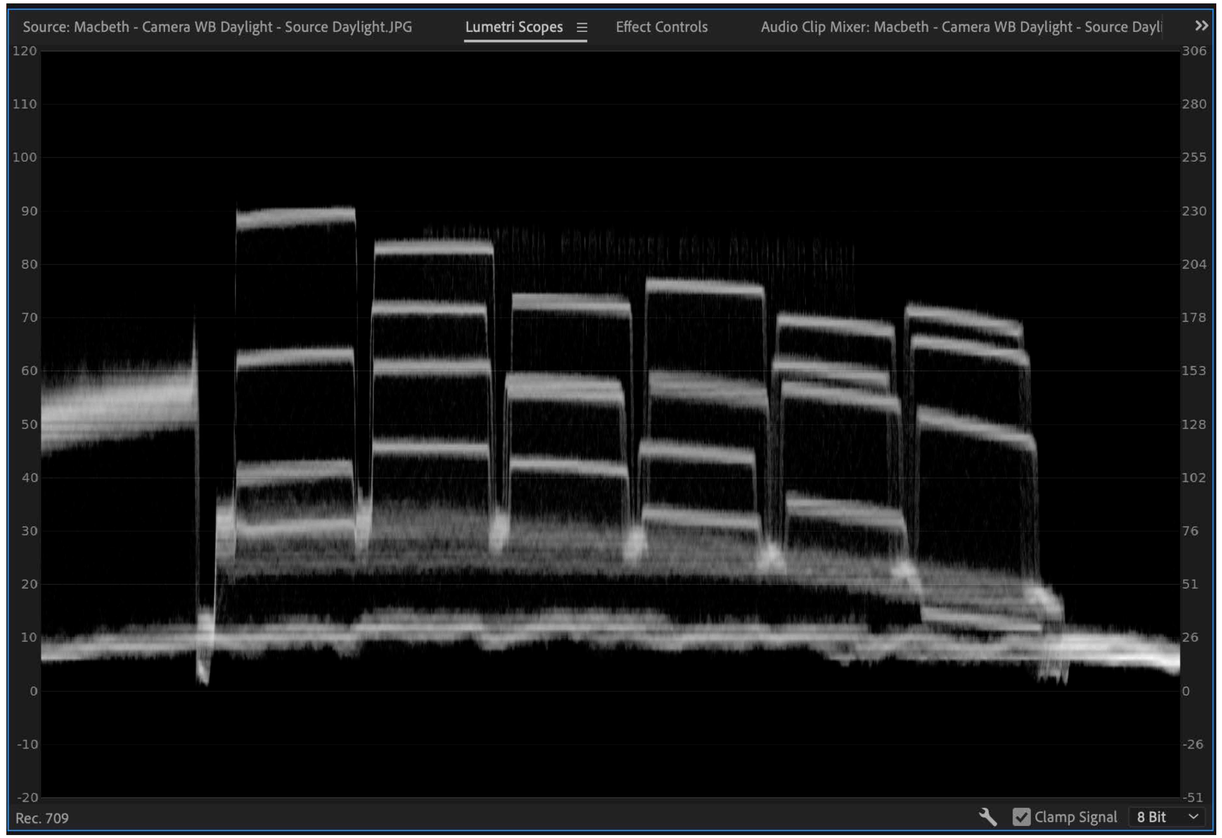
What is good exposure?



Using the a7iii in movie mode with manual exposure

What is good exposure?

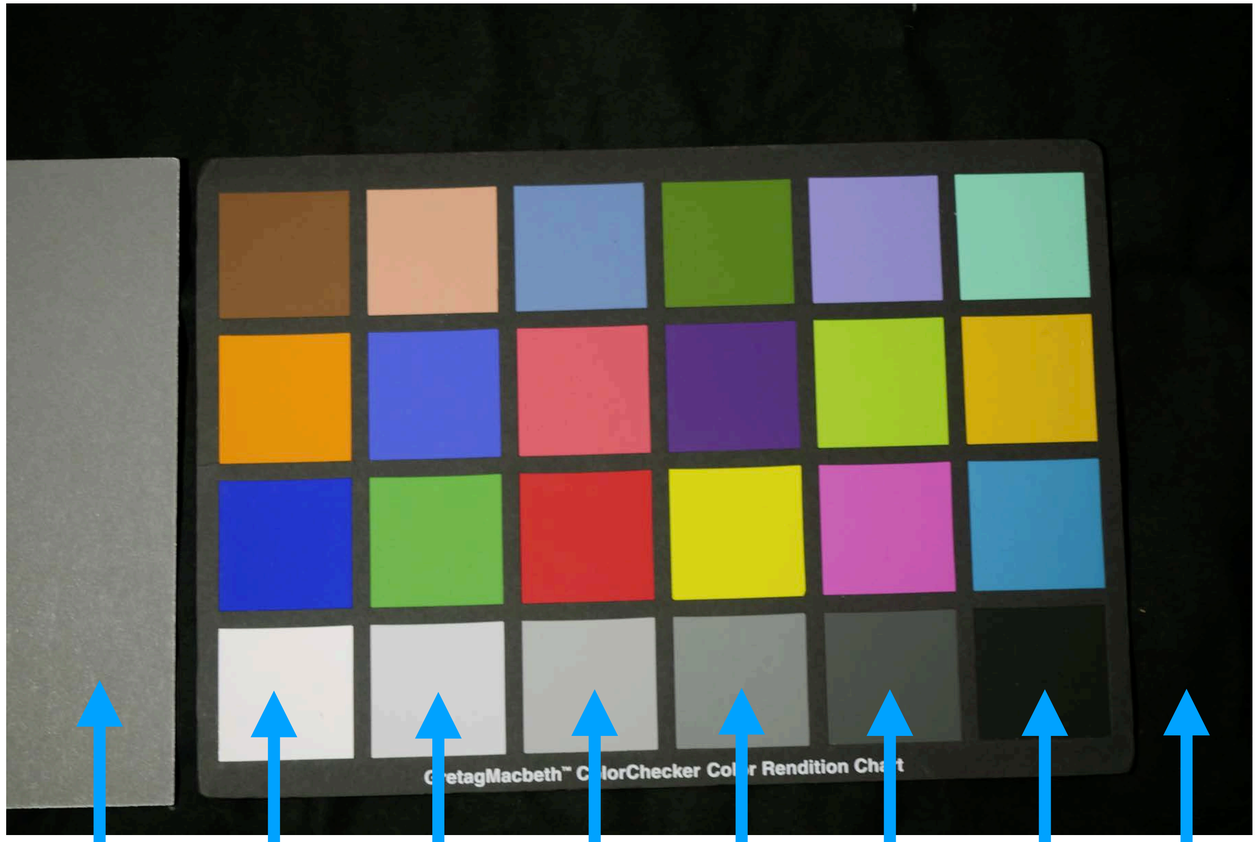


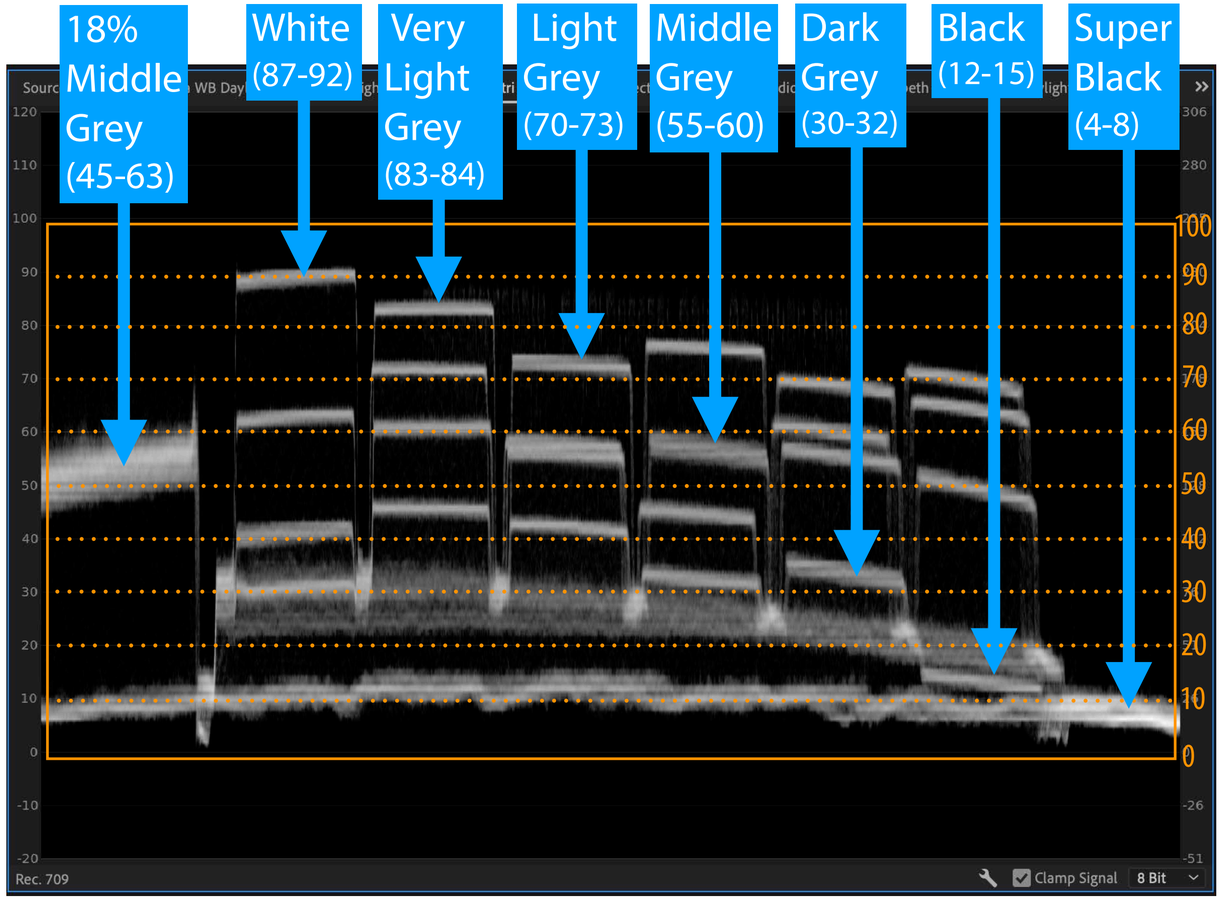


Waveform Monitor

shows luminance component of the video signal, may be found in external monitors and Lumetri Scopes in Premiere Pro

Using the a7iii in movie mode with manual exposure





Waveform Monitor

shows luminance component of the video signal, may be found in external monitors and Lumetri Scopes in Premiere Pro

Using the a7iii in movie mode with manual exposure

What is good exposure?

2 stops under | 1 stop under | about right | 1 stop over | 2 stops over

According to an exposure meter, a good exposure is when a surface with 18% reflectance in the scene is reproduced in the middle of the tonal scale (50)

In terms of creative vision, good exposure is whatever produces the image you are looking for.

Using the a7iii in movie mode with manual exposure

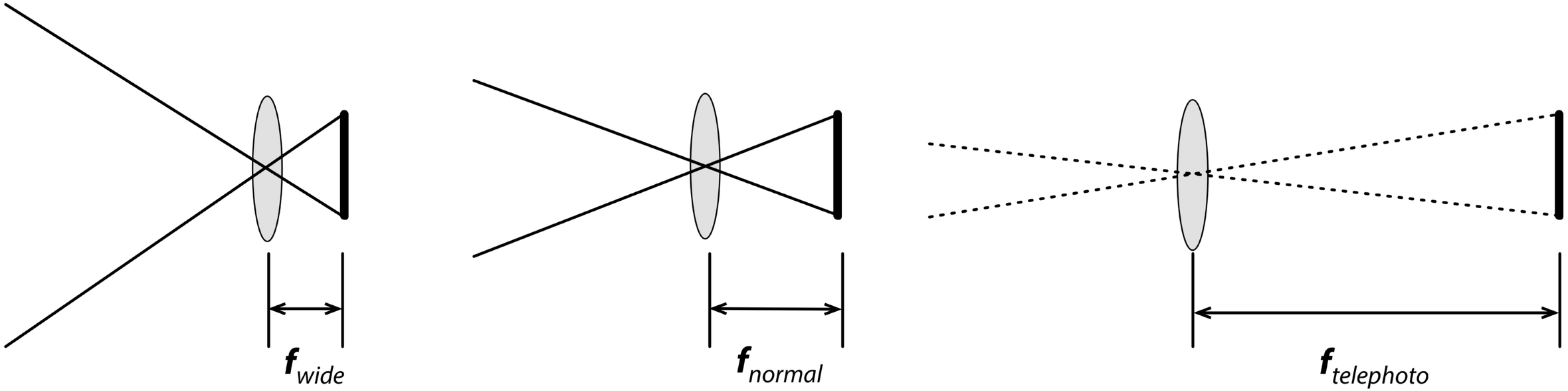
What is focal length?

Prime lens: A lens with a fixed focal length.

Zoom lens: a lens with a variable focal length.

Using the a7iii in movie mode with manual exposure

What is focal length?



The **focal length** of a lens is the distance between the optical center of the lens and the image sensor where the subject is in focus, usually stated in millimeters. The focal length of the lens determines:

- field of view (a.k.a. angle of view),
- perspective,
- depth of field, and
- motion blur, as a result of camera movement (depending on angular velocity, higher for longer focal lengths)

Using the a7iii in movie mode with manual exposure

Focal length and angle of view

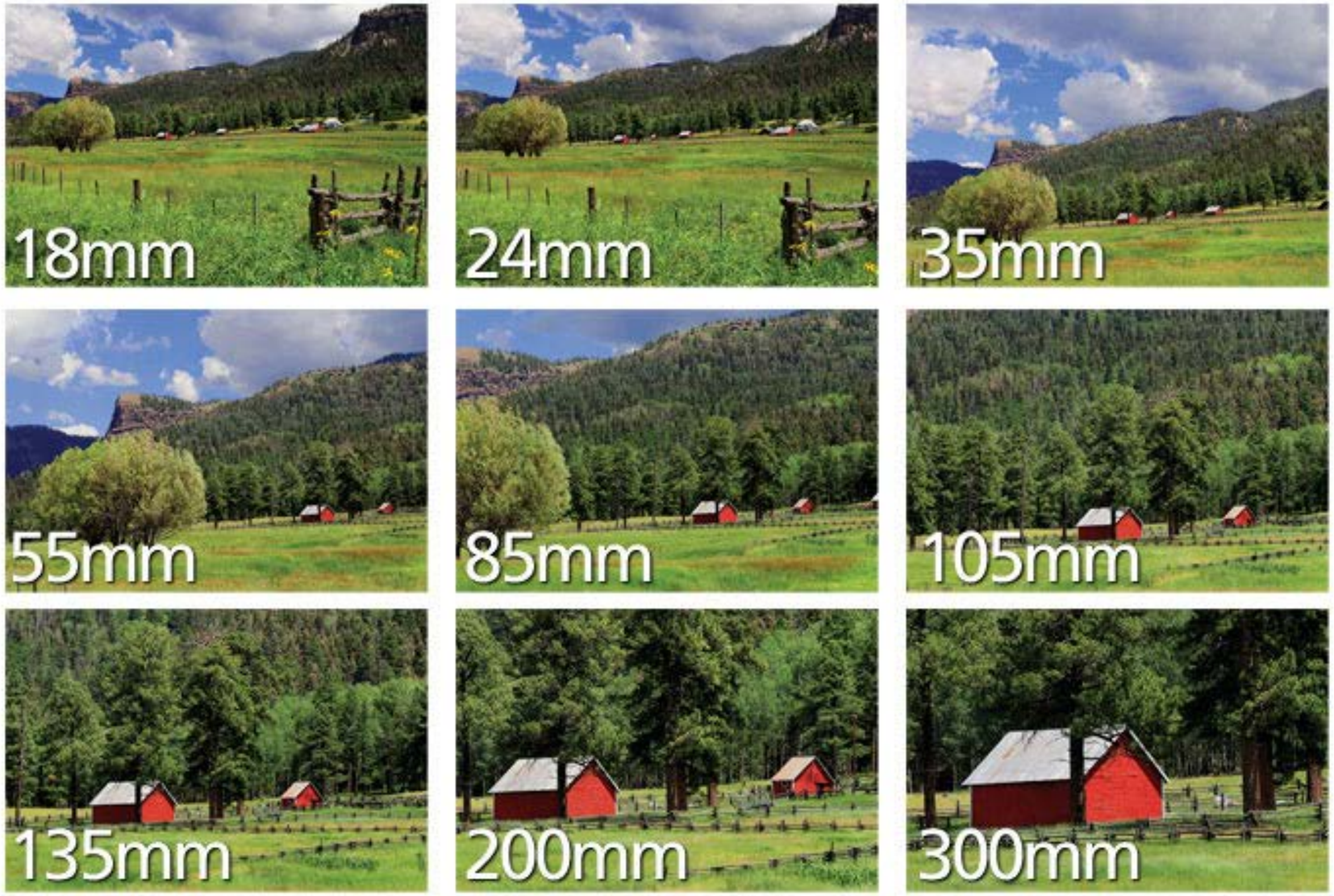
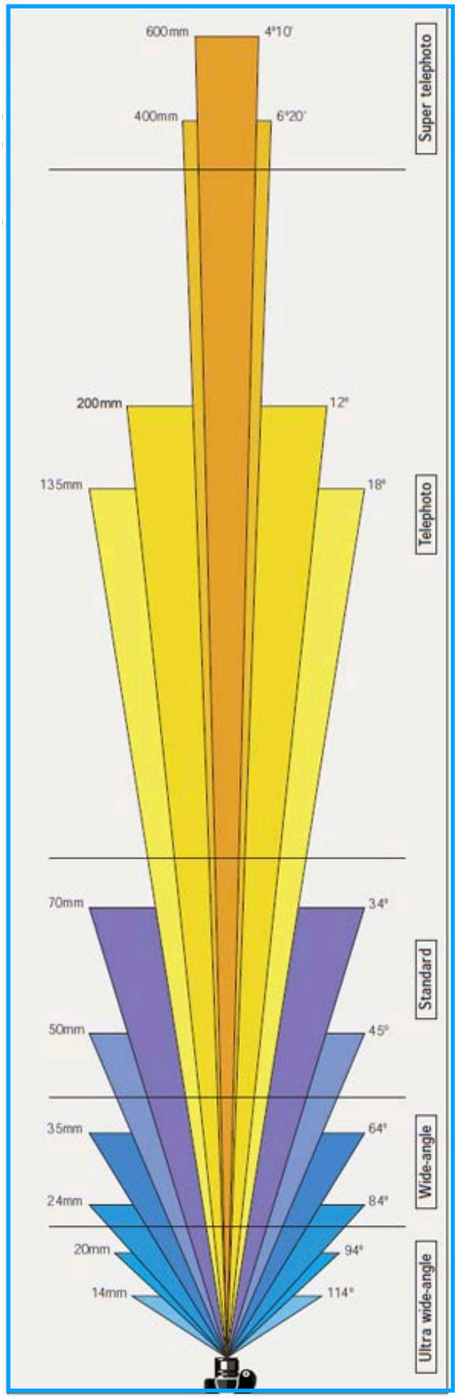
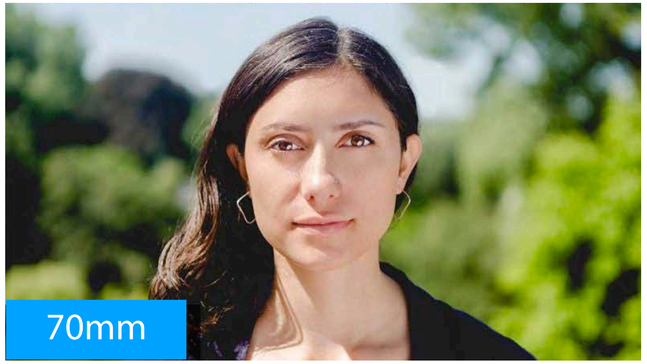


Image source: Nikon USA

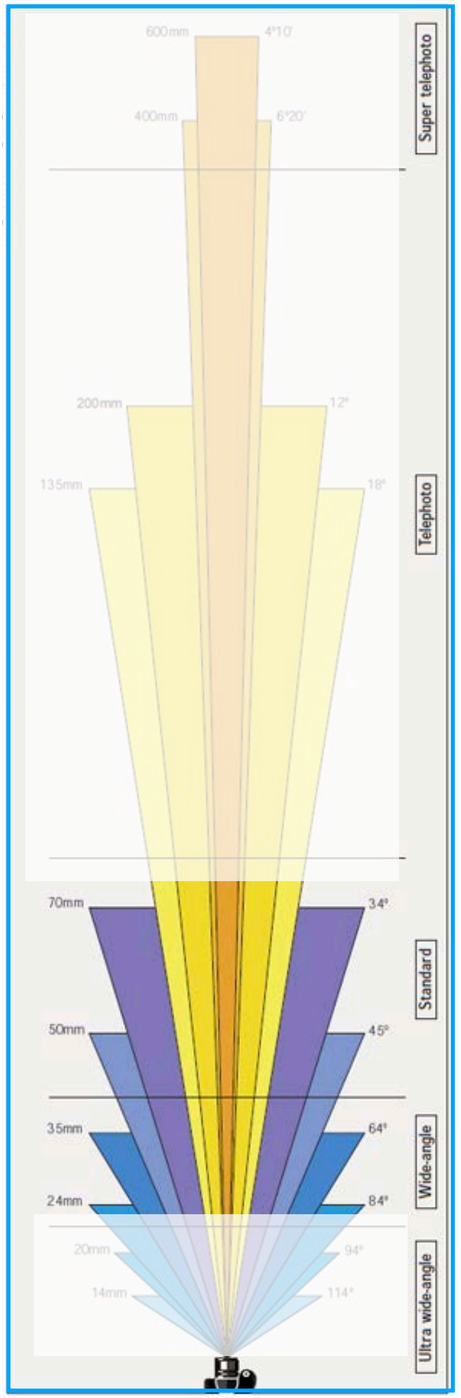


Using the a7iii in movie mode with manual exposure

Focal length and angle of view and perspective



The Sigma 24-70mm f/2.8 zoom lens covers this range



Images: Jackson Kingsley, https://fivedayfilm.com/guide-to-cinematic-shots/ (©) Chart: Nikon USA (©)

Using the a7iii in movie mode with manual exposure

Focal length and angle of view and perspective

A **normal lens** reproduces a field of view and perspective that appears “natural” to a human observer. In addition to angle of view differences, wide-angle lenses exhibit depth expansion while telephoto lenses exhibit depth compression, both introducing noticeable distortion in comparison to a normal lens.

Images by Dan Vojtěch, http://www.danvojtech.cz

Using the a7iii in movie mode with manual exposure

Focal length and angle of view and perspective

Images by Dan Vojtěch, http://www.danvojtech.cz

Using the a7iii in movie mode with manual exposure

Focal length and angle of view and perspective

Images by Dan Vojtěch, http://www.danvojtech.cz

Using the a7iii in movie mode with manual exposure

What is aperture?

Using the a7iii in movie mode with manual exposure

What is aperture?

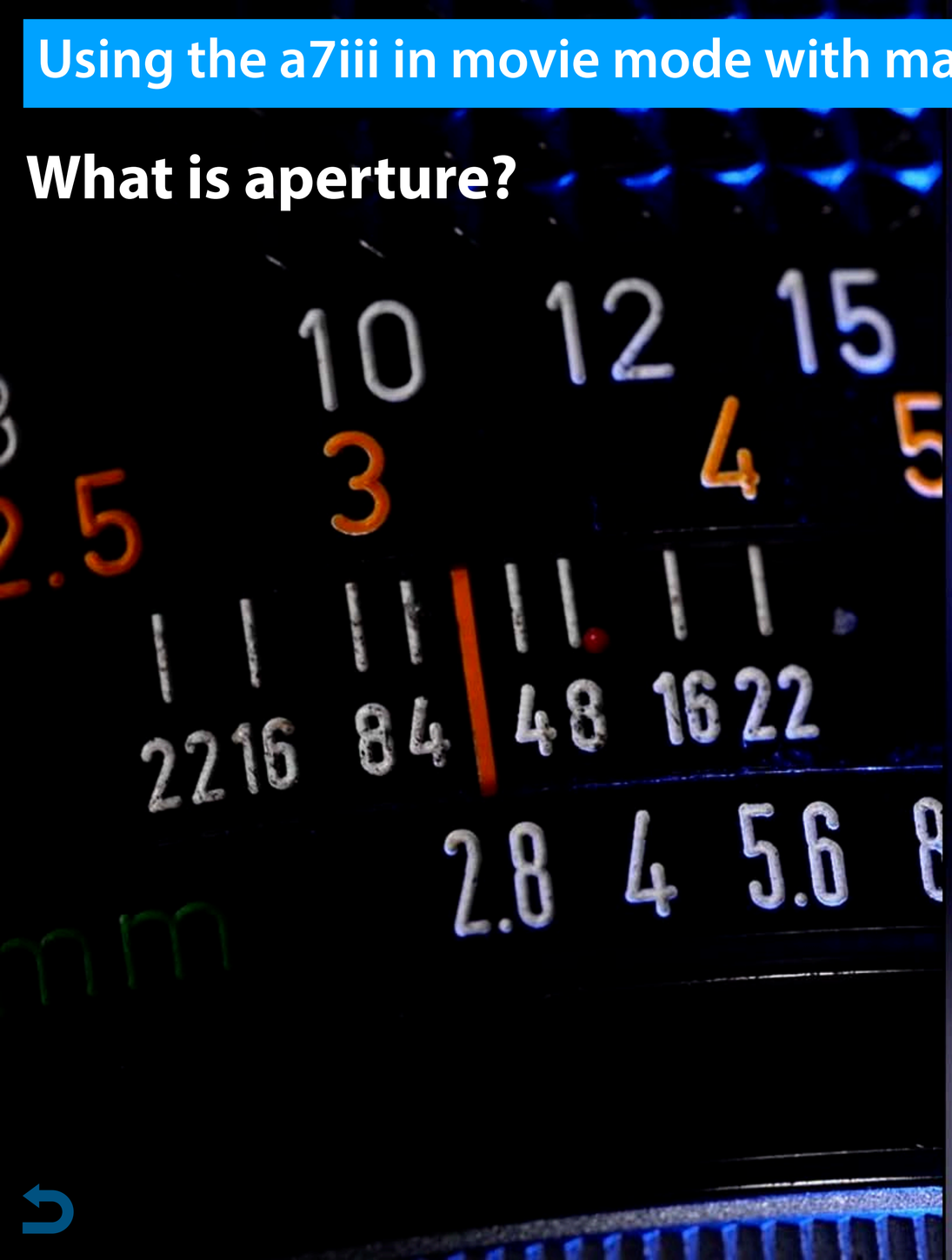
The amount of light captured by a lens is proportional to the area of the aperture, related via the f-number:

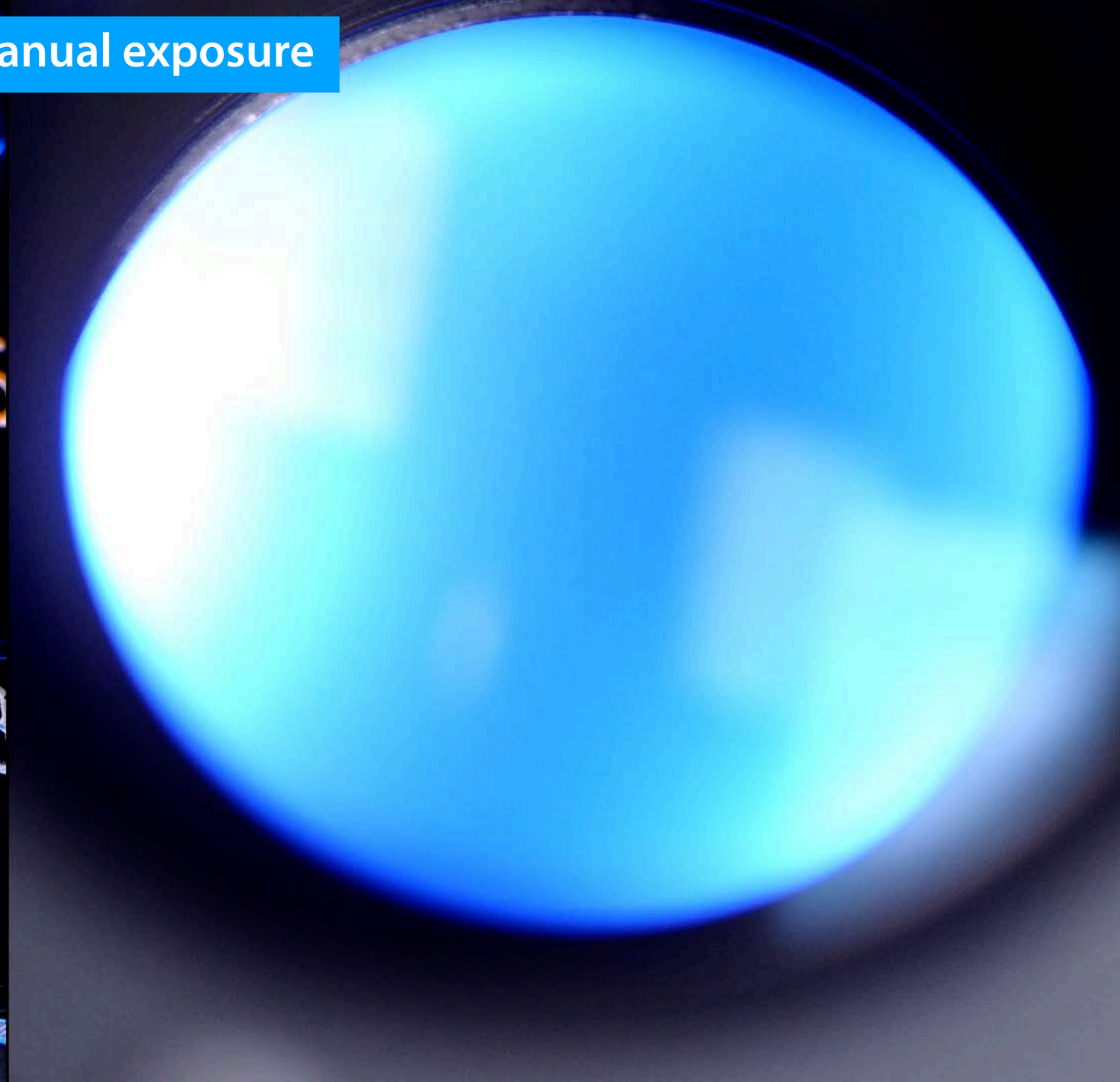
$$N = f / D$$

with focal length f and aperture diameter D, this is why we end up with the funny numbers like f/2.8

Using the a7iii in movie mode with manual exposure

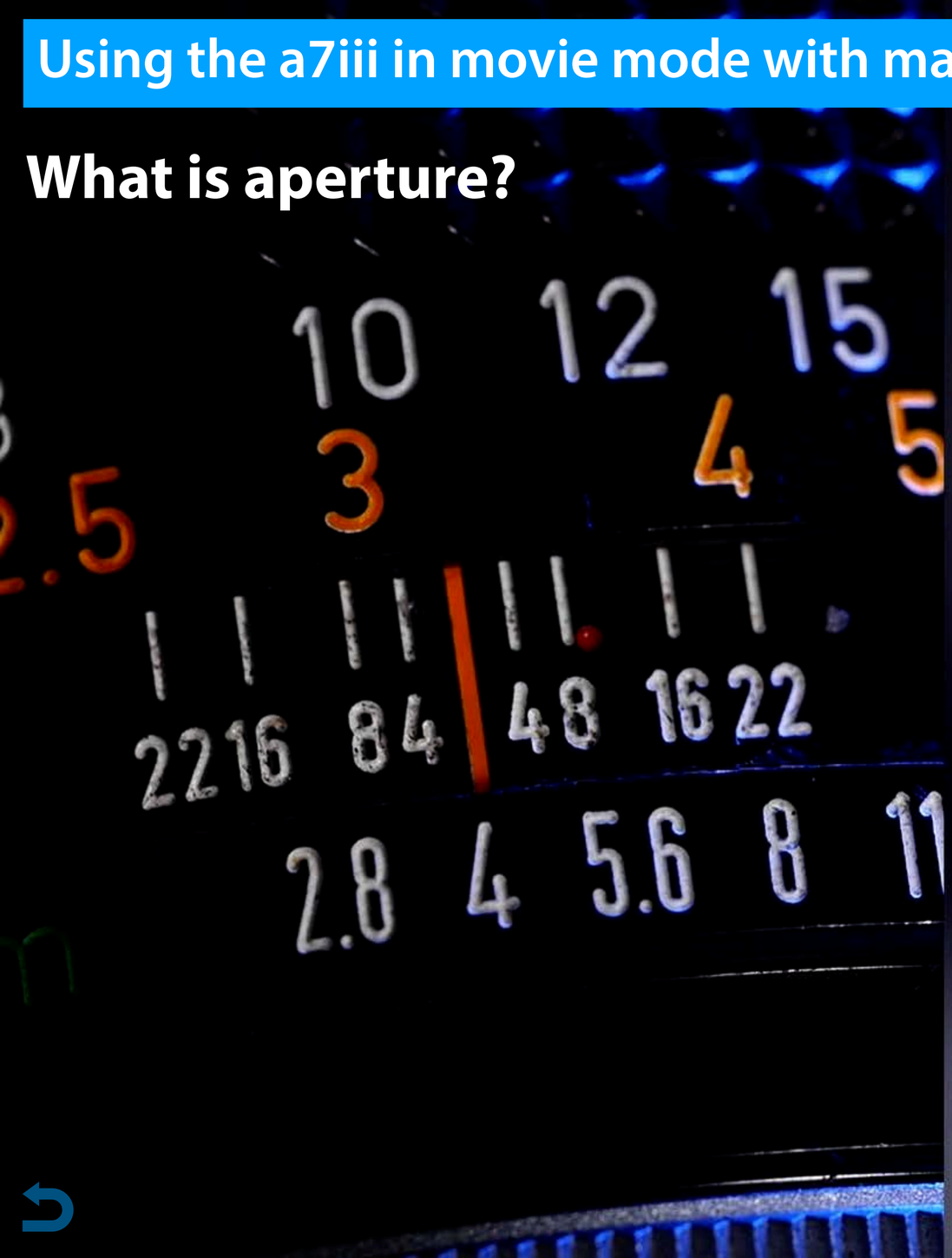
What is aperture?

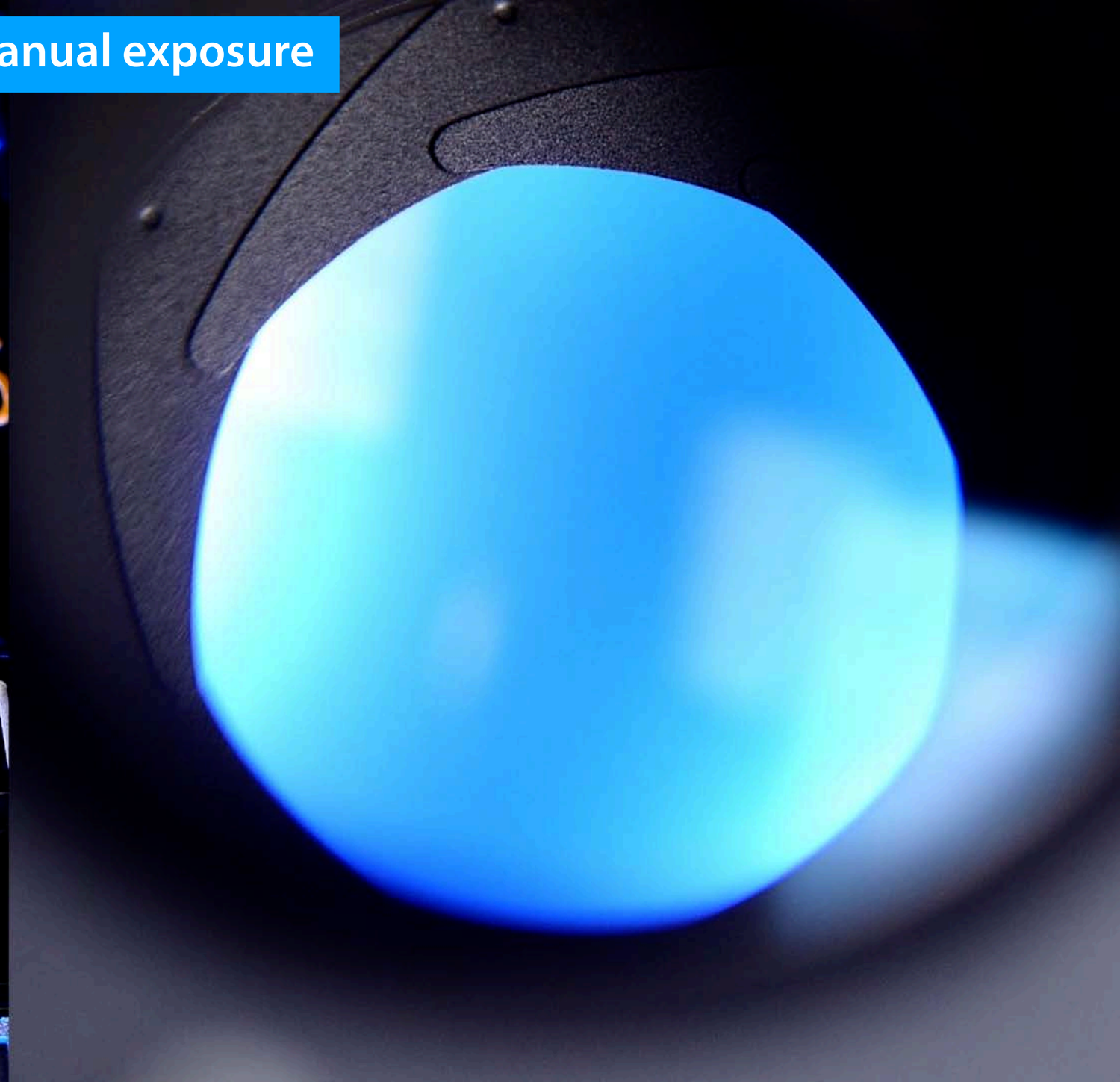




Using the a7iii in movie mode with manual exposure

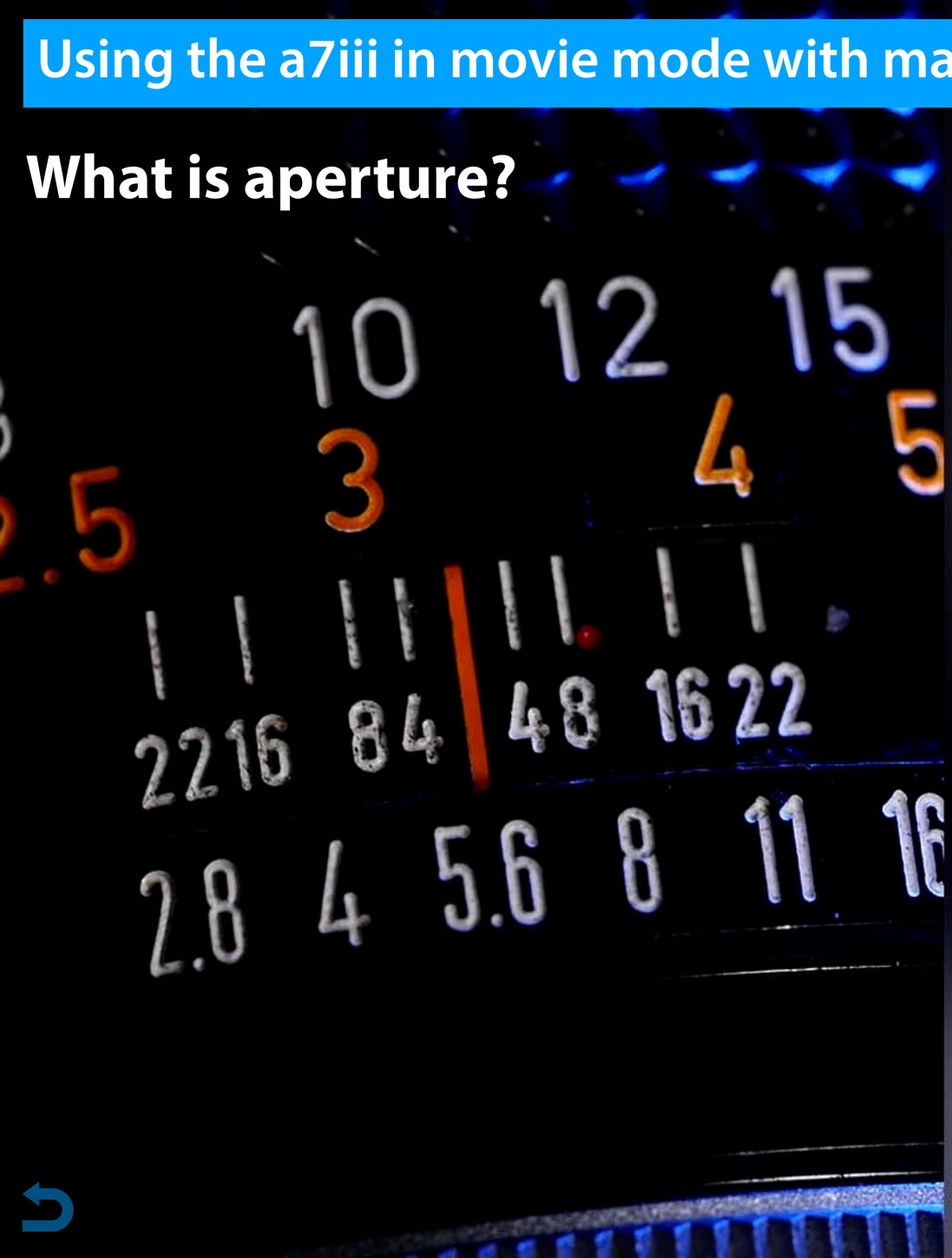
What is aperture?

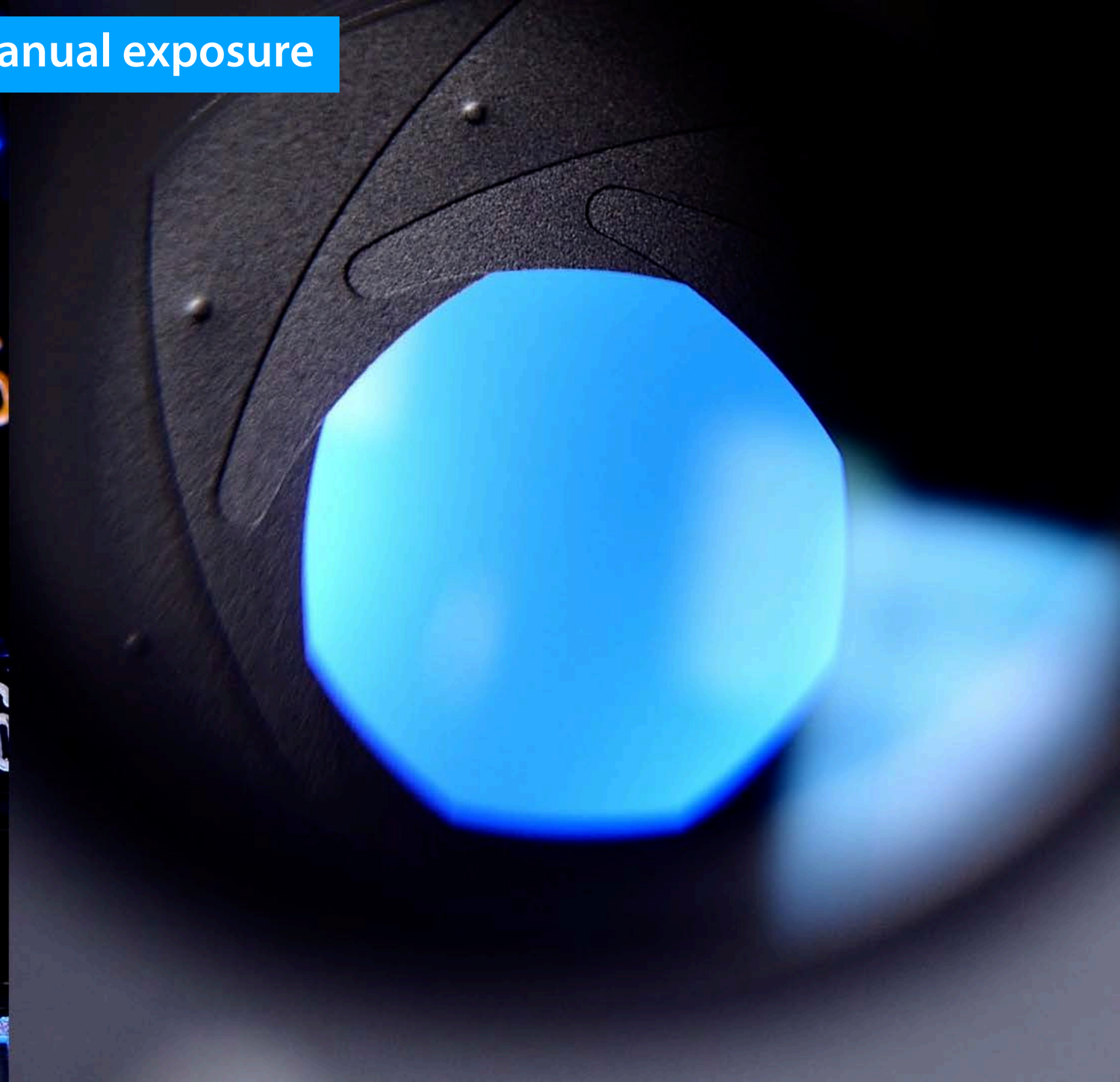




Using the a7iii in movie mode with manual exposure

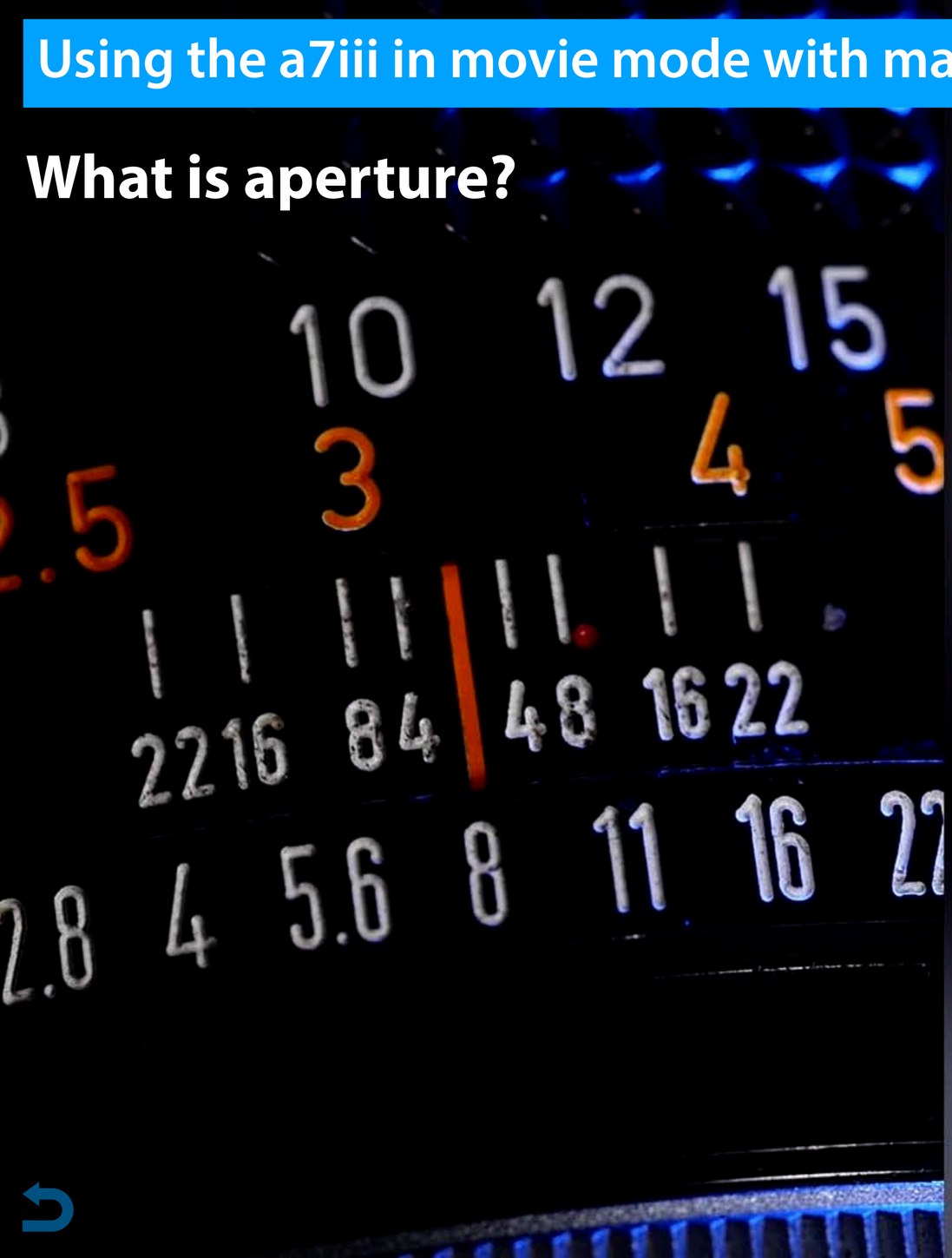
What is aperture?

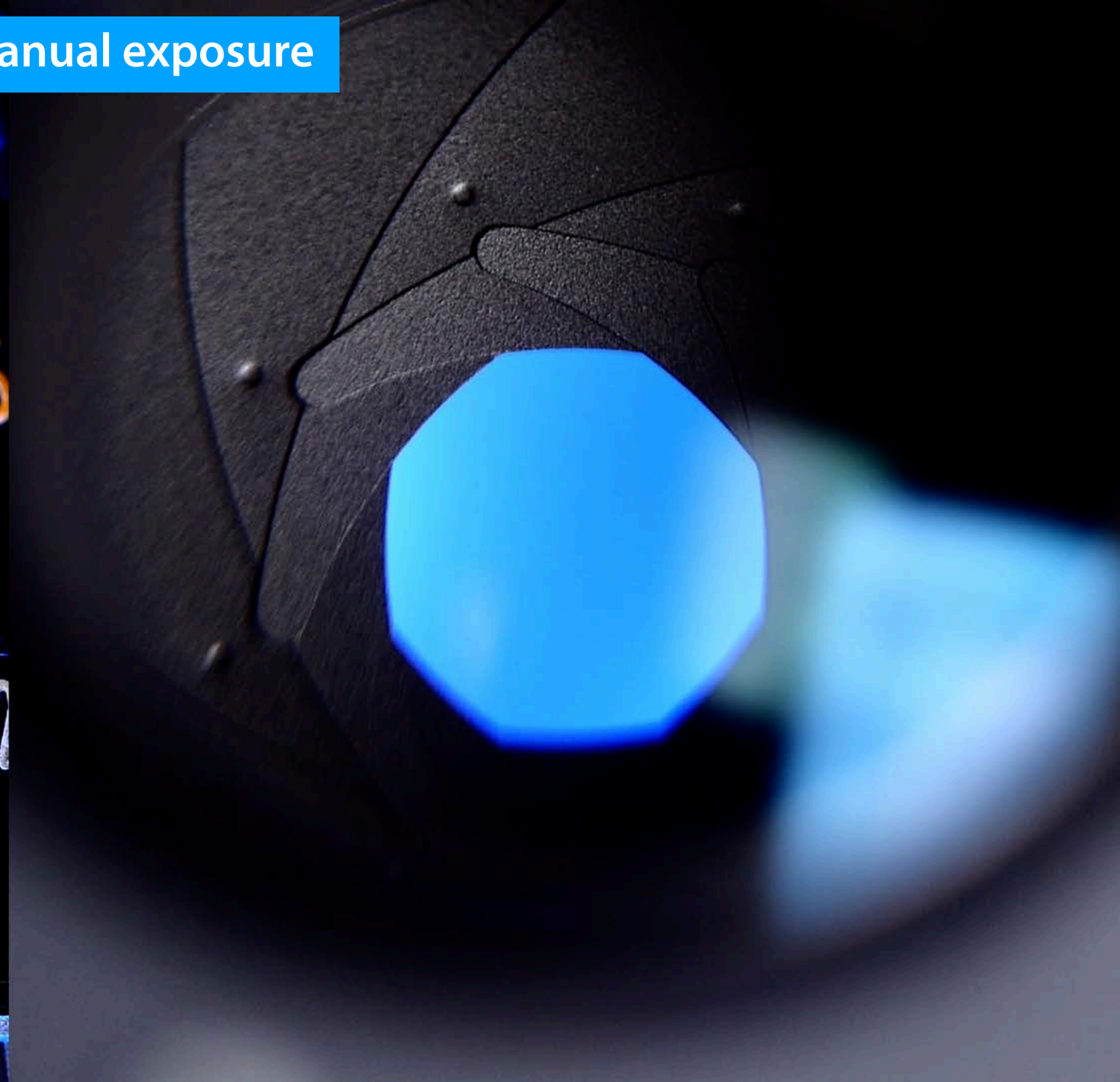




Using the a7iii in movie mode with manual exposure

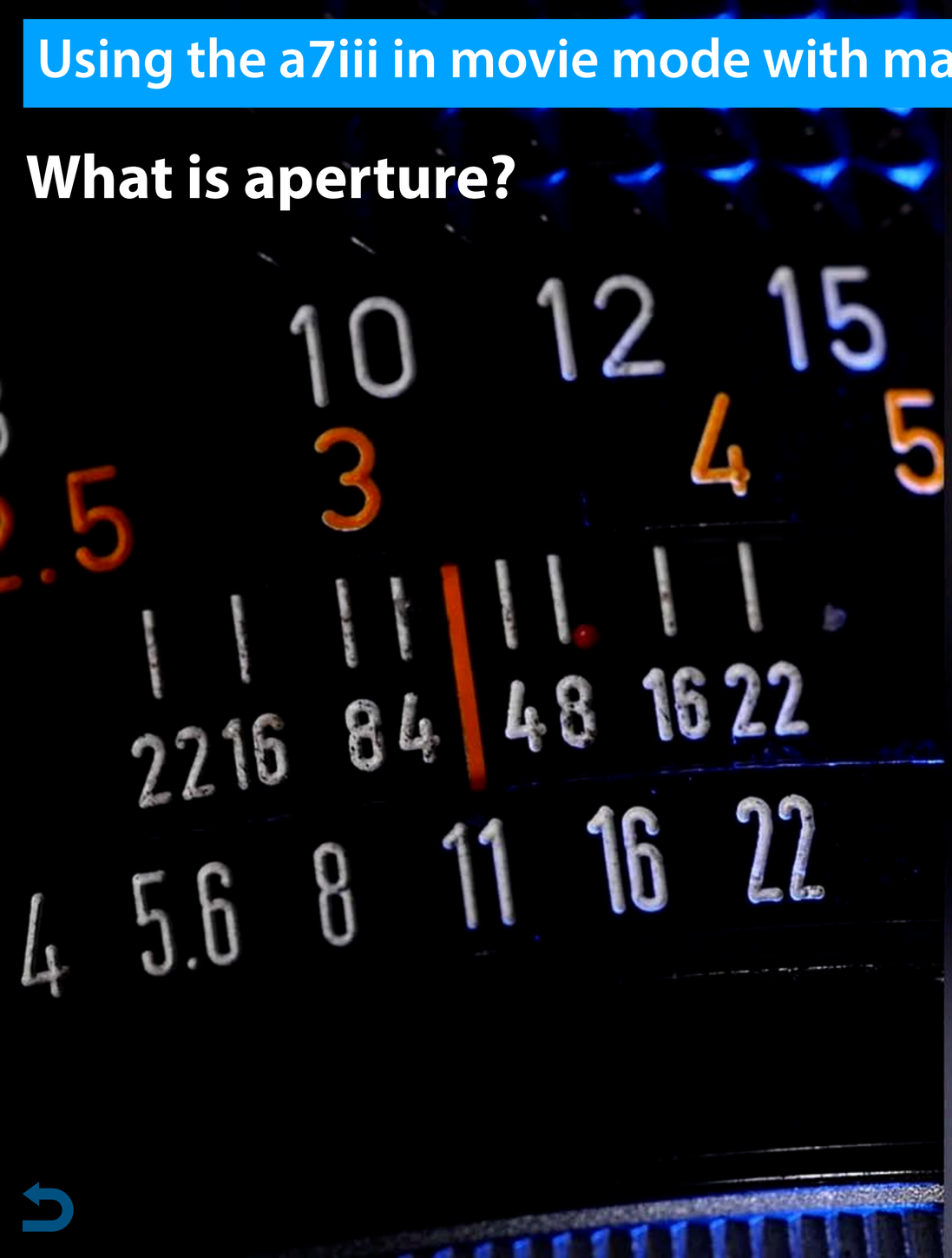
What is aperture?

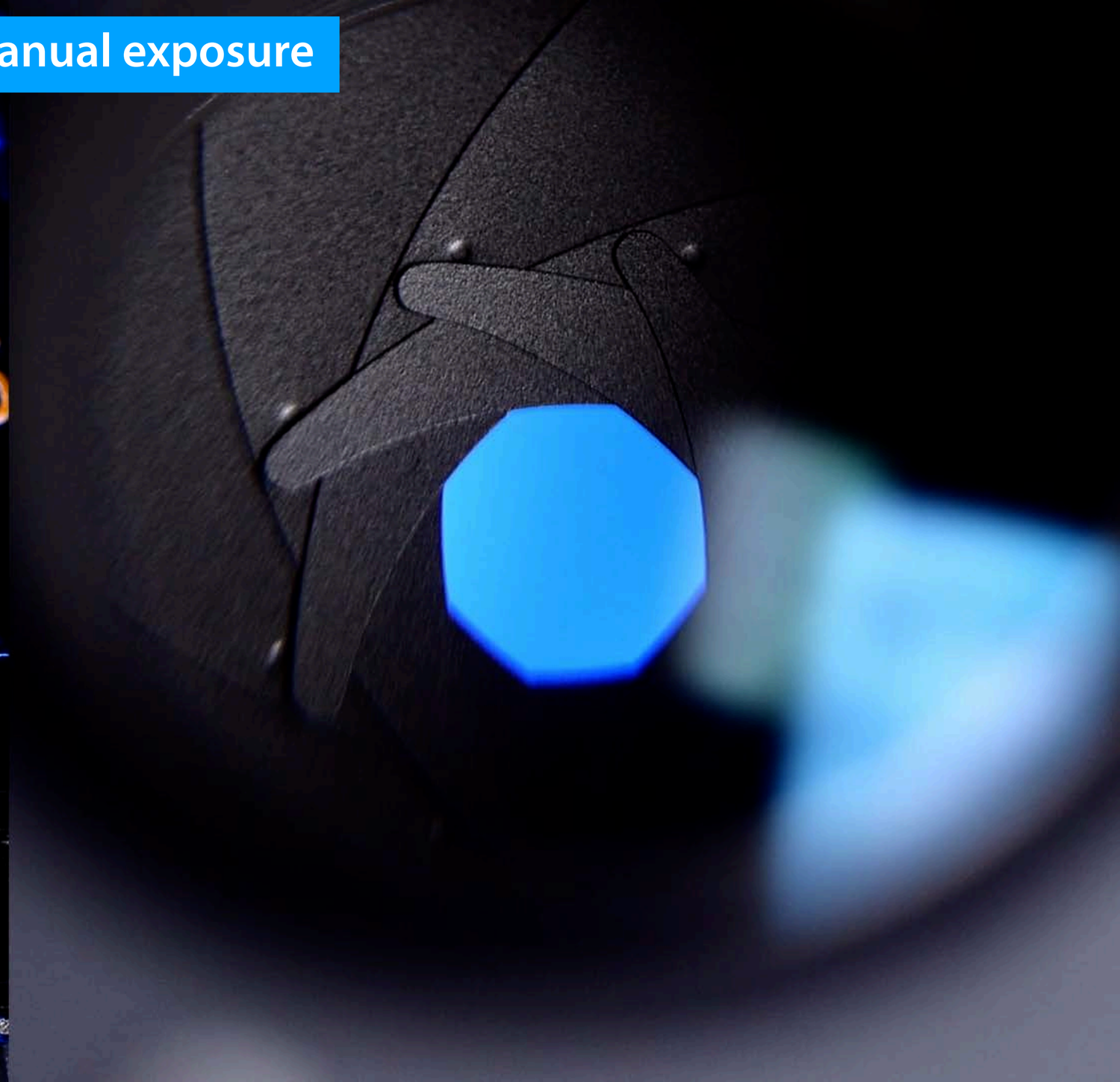




Using the a7iii in movie mode with manual exposure

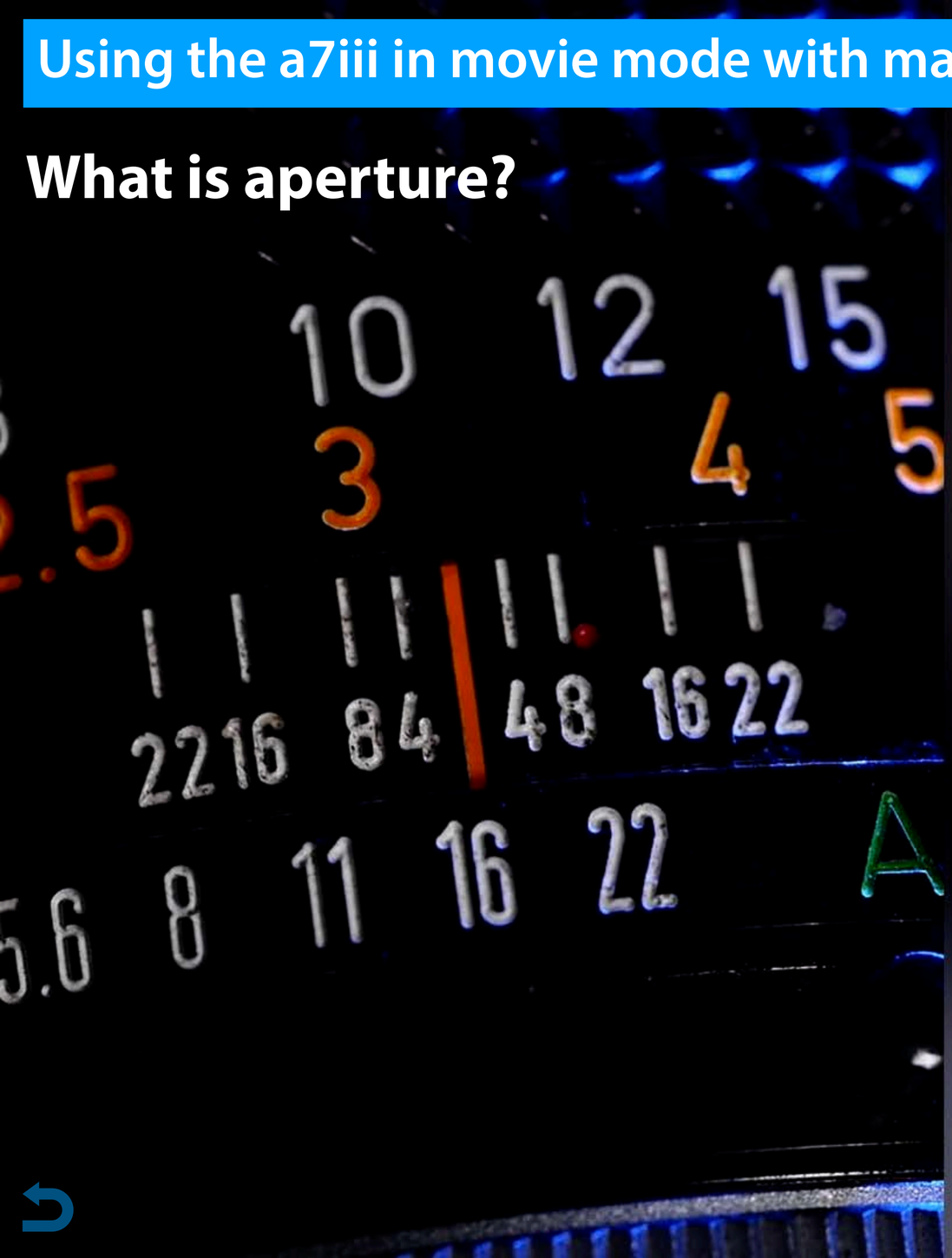
What is aperture?

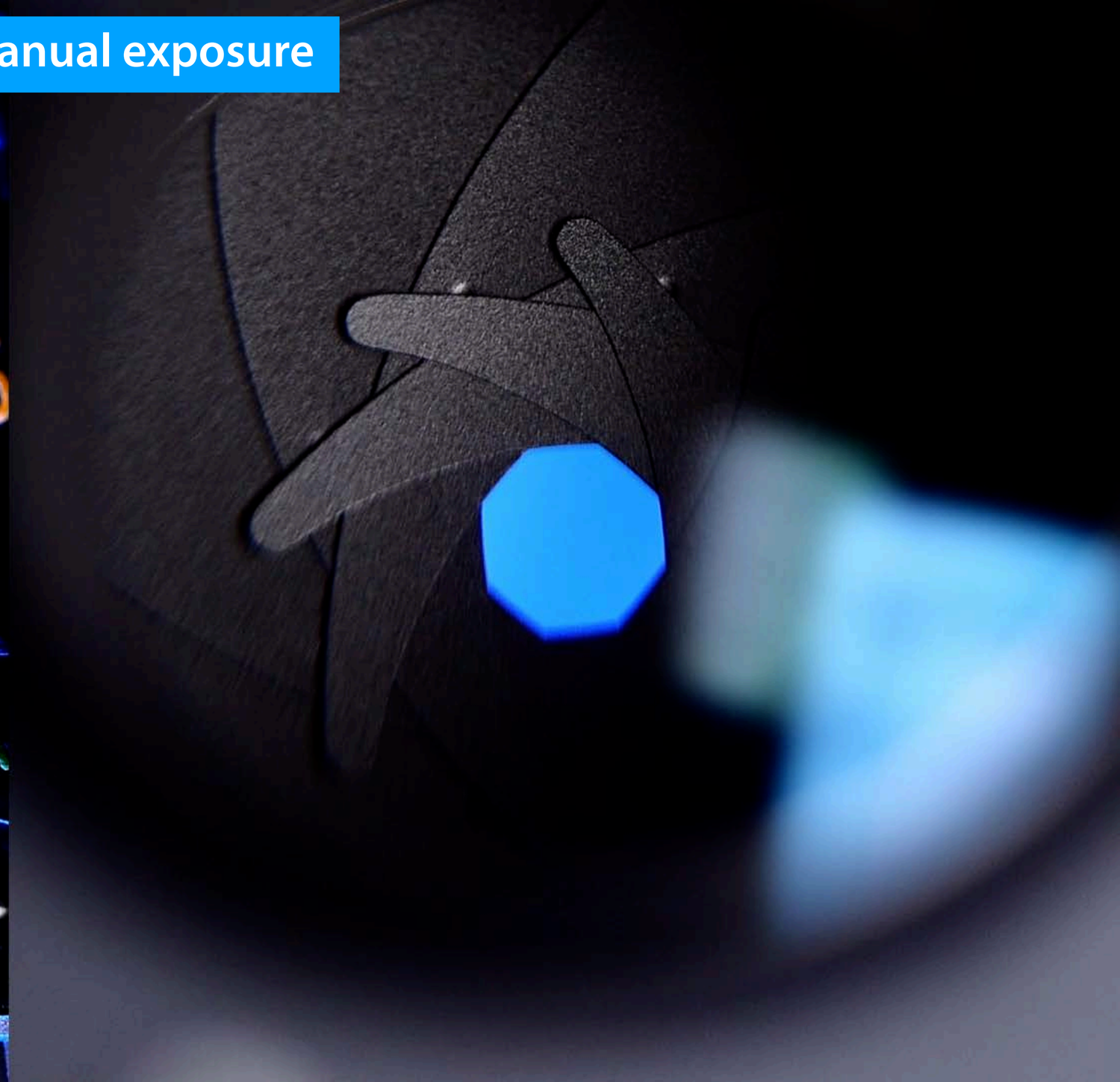




Using the a7iii in movie mode with manual exposure

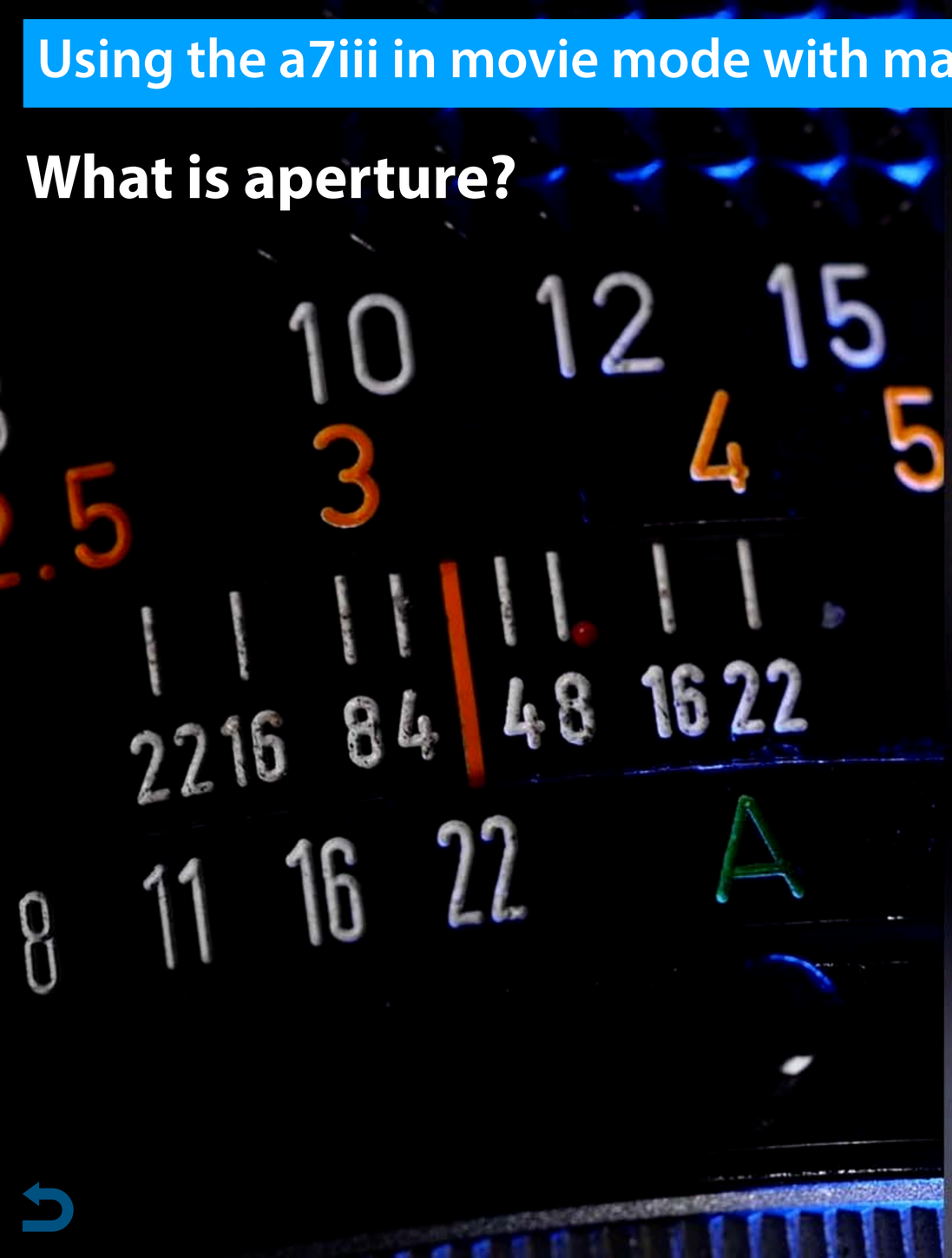
What is aperture?





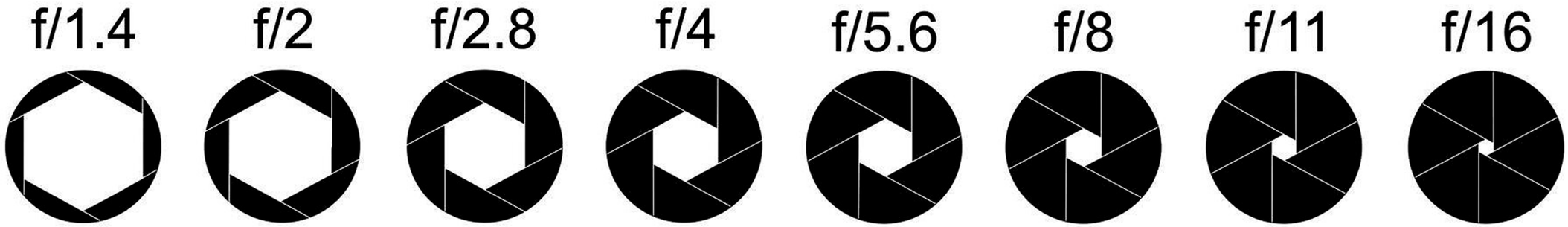
Using the a7iii in movie mode with manual exposure

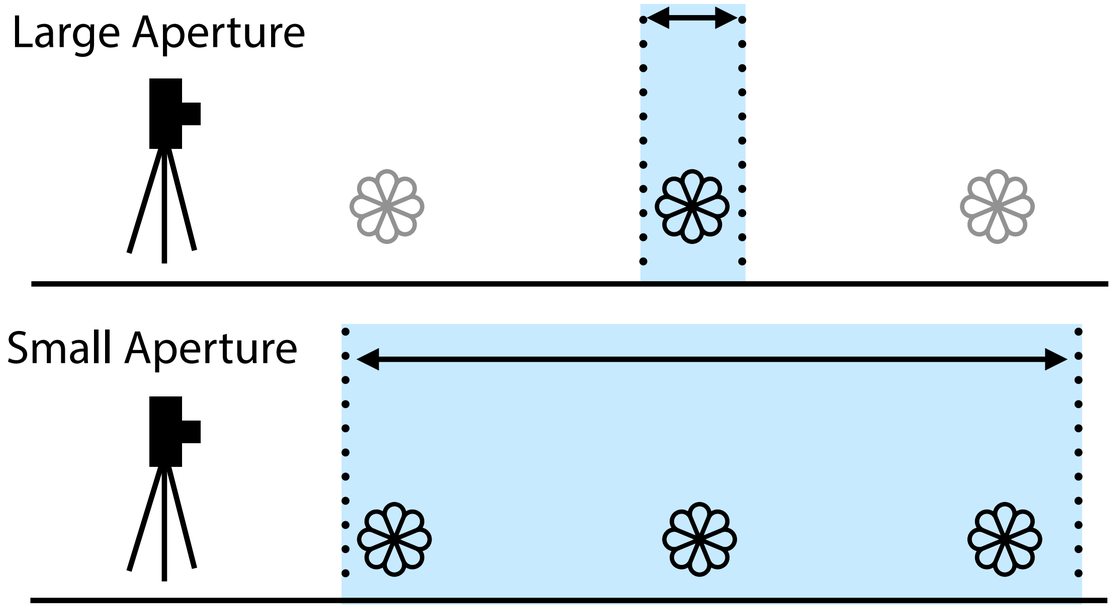
What is aperture?



Using the a7iii in movie mode with manual exposure

What is aperture?





The **aperture** has an effect on both exposure and depth of field.

f-stop (a.k.a. f-number) the ratio of the lens focal length to the diameter of the entrance pupil.

Depth of field is a function of three factors: focal length of the lens, the aperture, and the focus setting.

Large apertures yields shallow depth of field while **smaller apertures** yield greater depth of field.

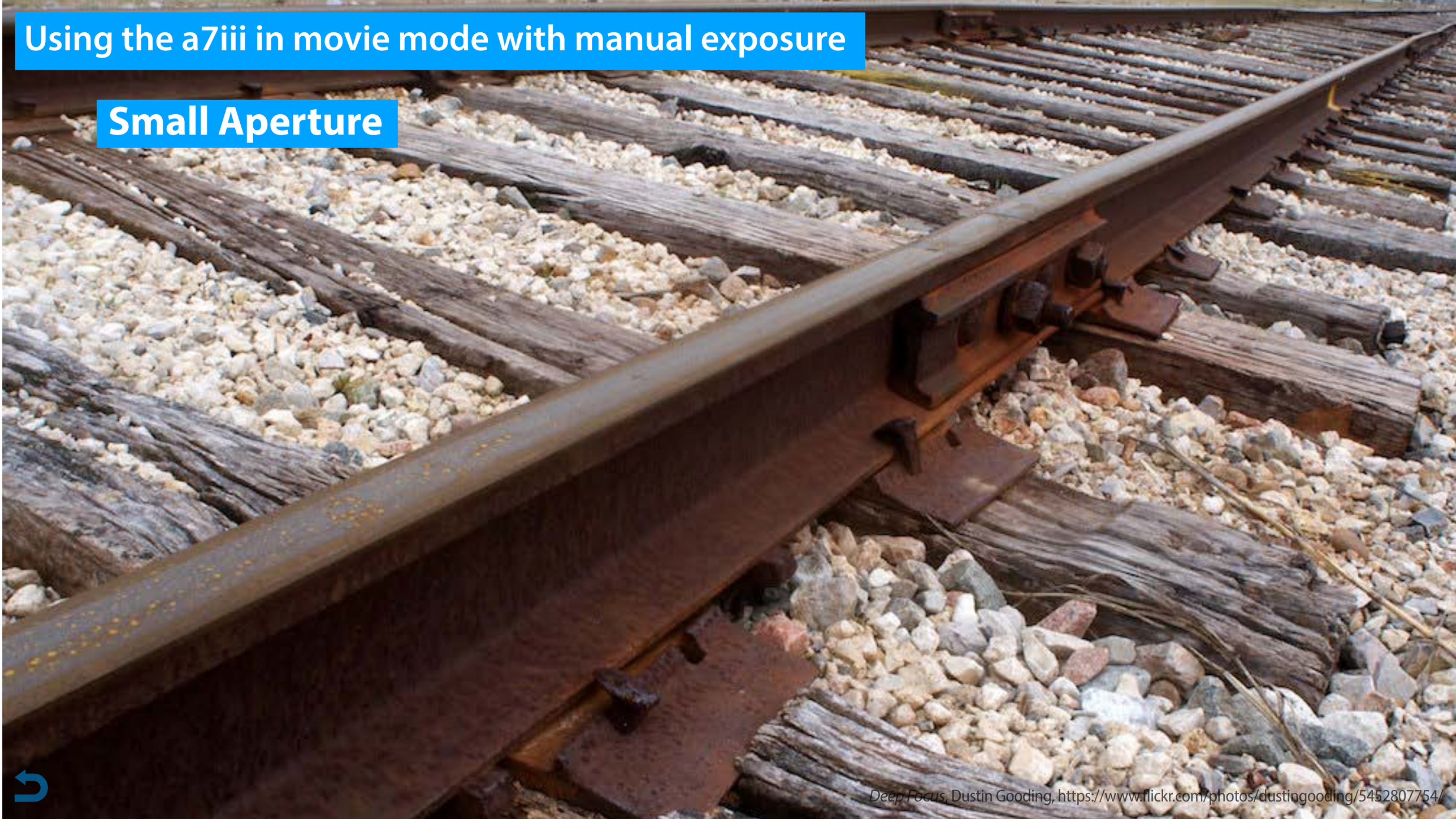
Using the a7iii in movie mode with manual exposure

Large Aperture

Sterling Recycling Center, David Tamés

Using the a7iii in movie mode with manual exposure

Small Aperture



Deep Focus, Dustin Gooding, https://www.flickr.com/photos/dustingooding/5452807754/

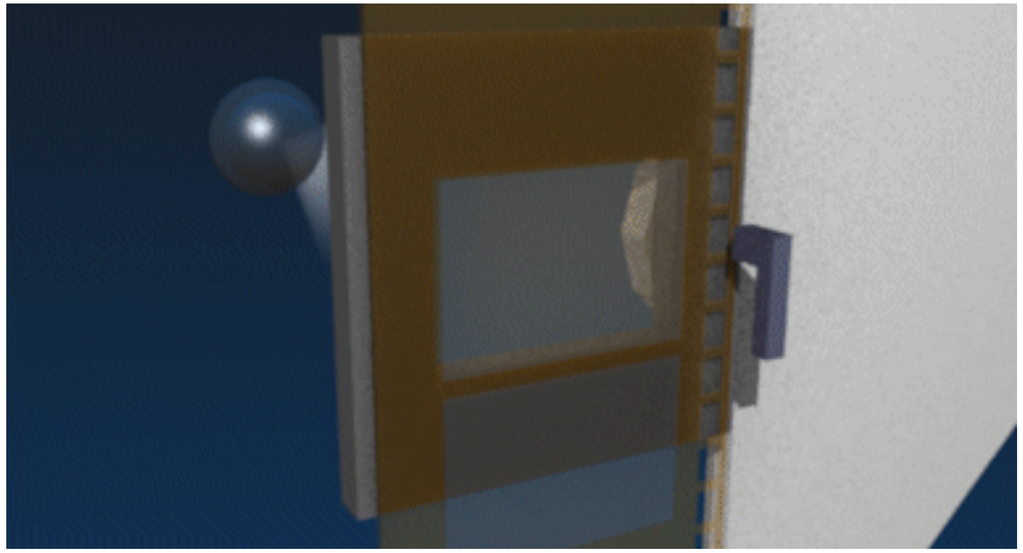
Using the a7iii in movie mode with manual exposure

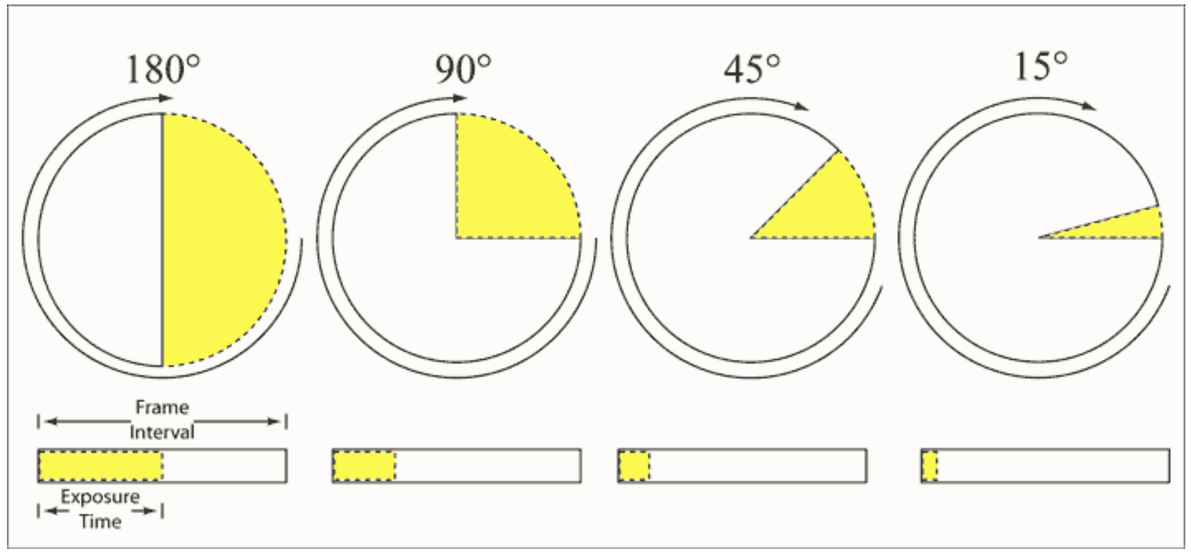
What is shutter speed?

The length of time that the sensor inside the camera is exposed to light when exposing a frame (video) or image (photography). The amount of light that reaches the sensor is proportional to the exposure time. 1/100 will let half as much light reach the sensor as 1/50.

Shutter speed, frame rate, and motion blur

Frame rate (designated in frames per second or FPS) is the rate (frequency) at which consecutive frames (images) are captured by a camera or displayed by a playback system. While temporal sensitivity and resolution of human vision varies between individuals and depends on the characteristics of the visual stimulus, roughly, a frame rate above 12 or fps are required to perceive the individual frames as movement, and a frame rate above 24 or so fps are required for the movement to appear smooth.



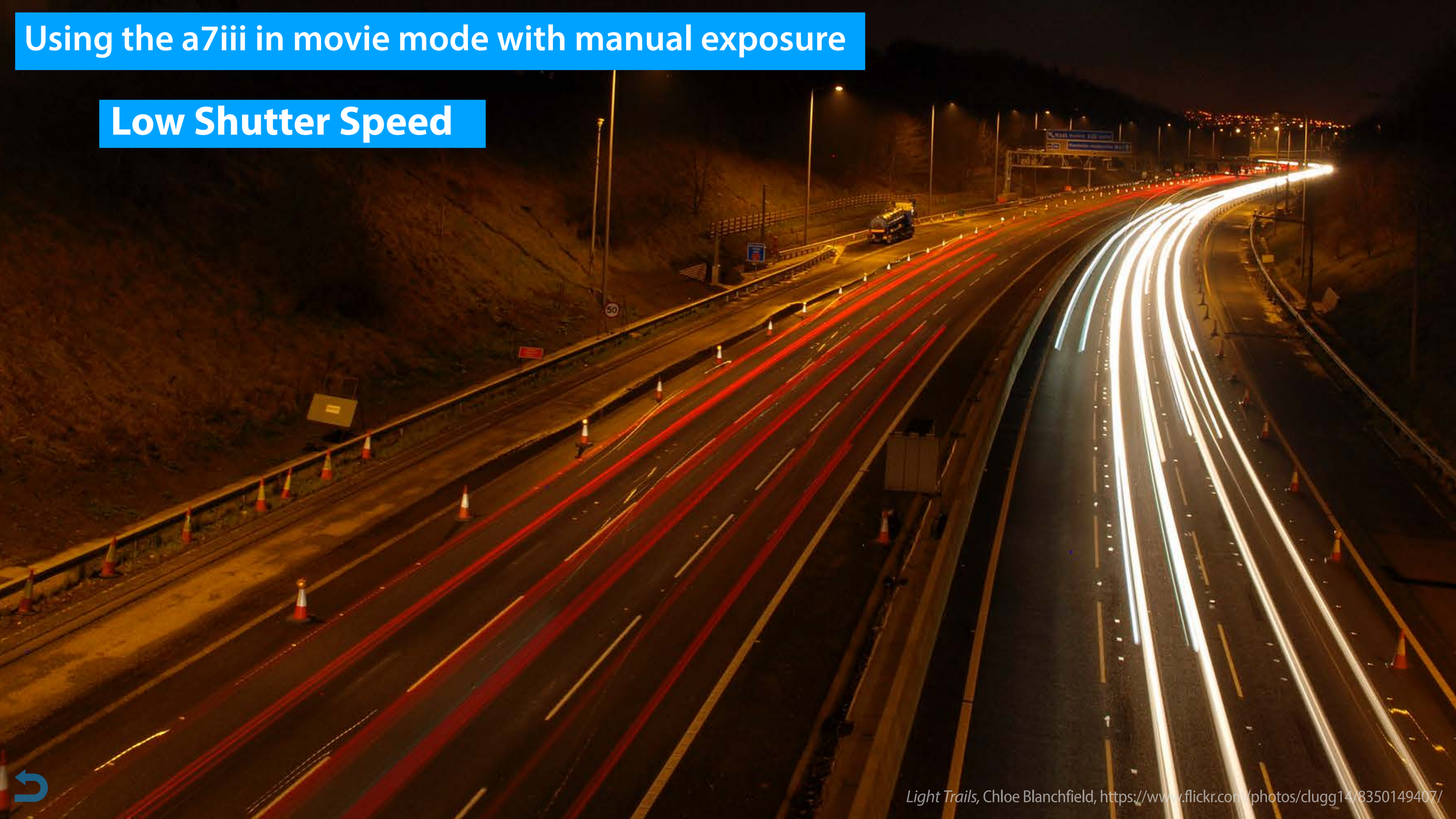


The cinema standard of 24 fps was a trade-off between smooth motion and film consumption. The standard 1/48 shutter speed is the result of a 180° rotating shutter. While the shutter blade covers the gate, the camera advances the film to the next frame. The frame is exposed while the shutter does not cover the gate. Higher shutter speeds are achieved by adjusting the shutter angle, with an effect on both exposure and motion blur, however, 180° became the standard and along with it motion blur of moving objects and/or camera movement due to 1/48 shutter speed, resulting in a major factor of the "film look."

Animation: Joram van Hartingsveldt (CC BY-SA 3.0), https://en.wikipedia.org/wiki/Rotary_disc_shutter#/media/File:Moviecam_schematic_animation.gif
Diagram: plowboylifestyle (CC BY-SA 3.0), https://en.wikipedia.org/wiki/File:ShutterAngle.png

Using the a7iii in movie mode with manual exposure

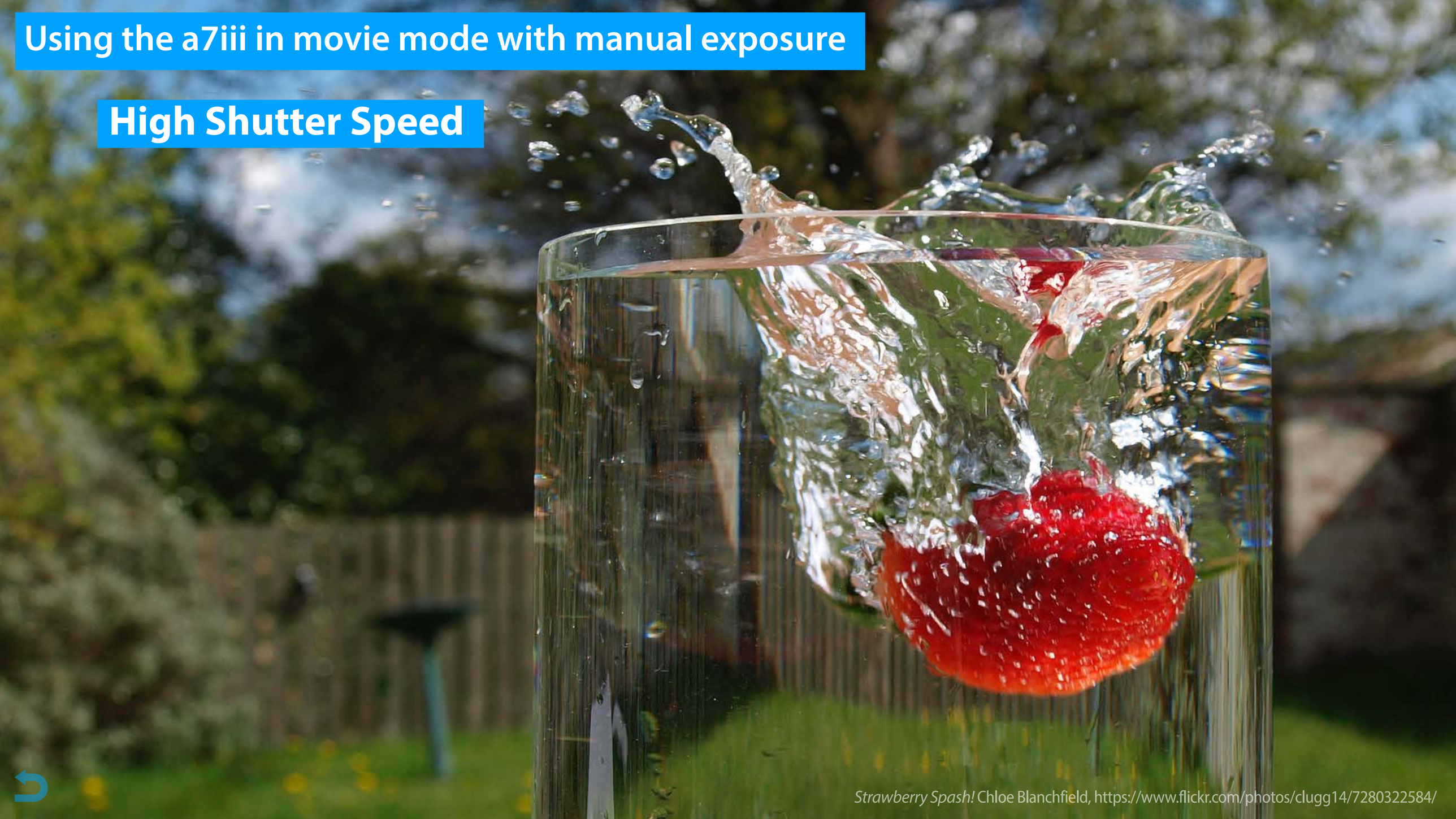
Low Shutter Speed



Light Trails, Chloe Blanchfield, https://www.flickr.com/photos/clugg14/8350149407/

Using the a7iii in movie mode with manual exposure

High Shutter Speed



Strawberry Spash! Chloe Blanchfield, https://www.flickr.com/photos/clugg14/7280322584/

Shutter speed, frame rate, and motion blur

24p

- “film look”
- Motion blur
- Use 1/50 shutter* (a7iii can’t do 1/48)

30p

- “video look"
- Motion blur similar, but less than 24p
- Use 1/60 shutter*

60p

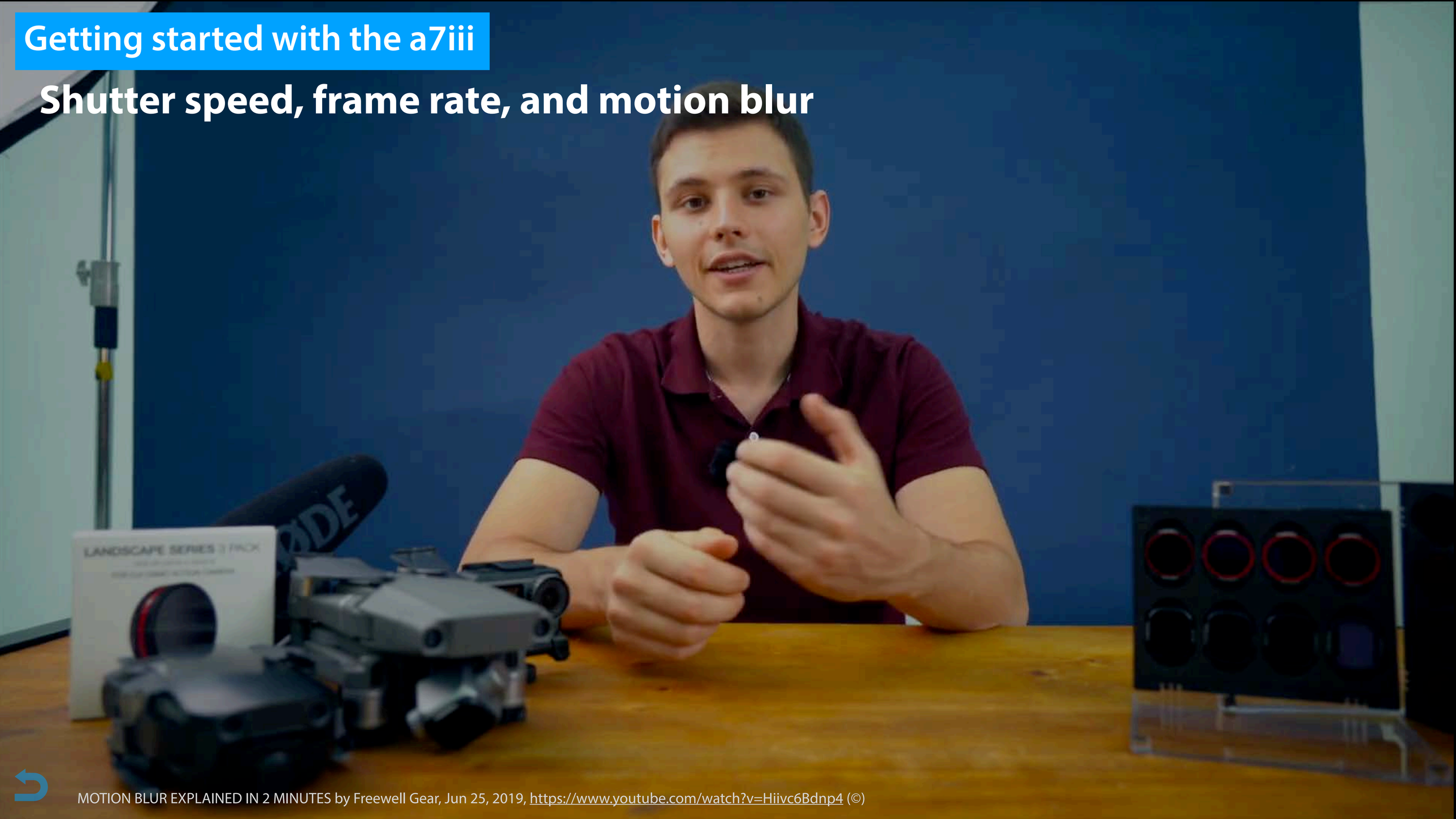
- “real look”
- Less motion blur
- Use 1/125 shutter* (a7iii can’t do 1/120)

120p

- “hyper-real look”
- Very little motion blur
- Use 1/250 shutter* (a7iii can’t do 1/240)

Getting started with the a7iii

Shutter speed, frame rate, and motion blur

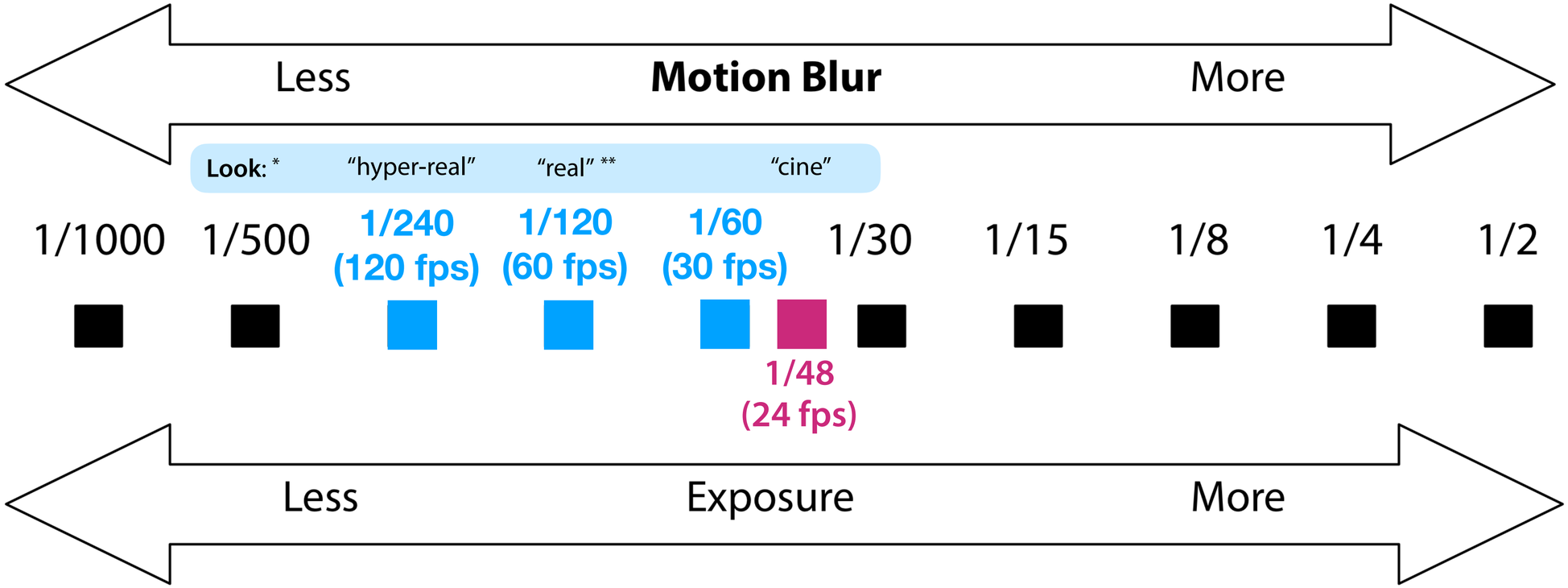


MOTION BLUR EXPLAINED IN 2 MINUTES by Freewell Gear, Jun 25, 2019, https://www.youtube.com/watch?v=Hiivc6Bdnp4 (©)

Using the a7iii in movie mode with manual exposure

Shutter speed, frame rate, and motion blur

Rule of thumb: Set shutter speed to 2x frame rate for "natural" motion blur (e.g. at 24 fps set shutter speed to 1/48
(Note: Sony a7iii can't do 1/48 so 1/50 is as close as we can get)



Each step represents one stop difference in exposure (1/2 or double)

* The "look" is a result of image refresh rate and motion blur, it is a perceptual phenomena, we perceive higher frame-rate acquisition/display as more "real"
** 60i (interlaced) video (60 fields/sec, 30 frames/sec) provides the "real look" while 30p video looks more like the cine look.

Using the a7iii in movie mode with manual exposure

What is ISO Sensitivity?

Sensitivity to light as a numerical value.

ISO Sensitivity

- Standard set by the International Organization for Standardization (ISO) representing sensitivity to light specified as a number
- A higher number indicates a higher sensitivity and a greater ability to capture light
- Double the number indicates double the sensitivity, half the number represents half the sensitivity
- The higher the sensitivity, the higher the noise level, sensors vary greatly in their noise levels
- Traditional film emulsions have ISO sensitivities in the 25 to 500 range; current digital sensors have much higher sensitivity

Leave this alone when working in manual.

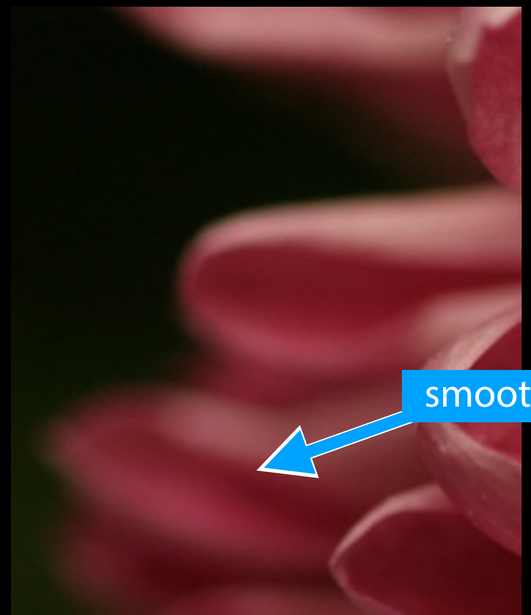
ISO setting

Press here to change ISO setting

Using the a7iii in movie mode with manual exposure

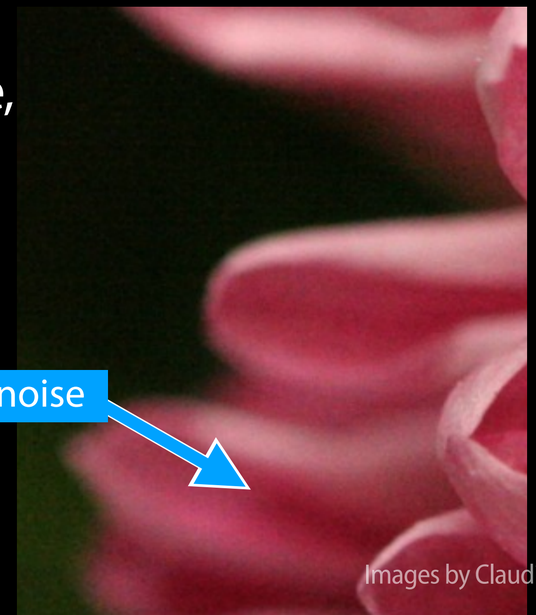
What is ISO sensitivity?

ISO 200 ISO 400 ISO 800 ISO 1600 ISO 3200



Low ISO, smoother image, lower sensitivity

High ISO, more noise, higher sensitivity



Images by Claudio Ramirez

Using the a7iii in movie mode with manual exposure

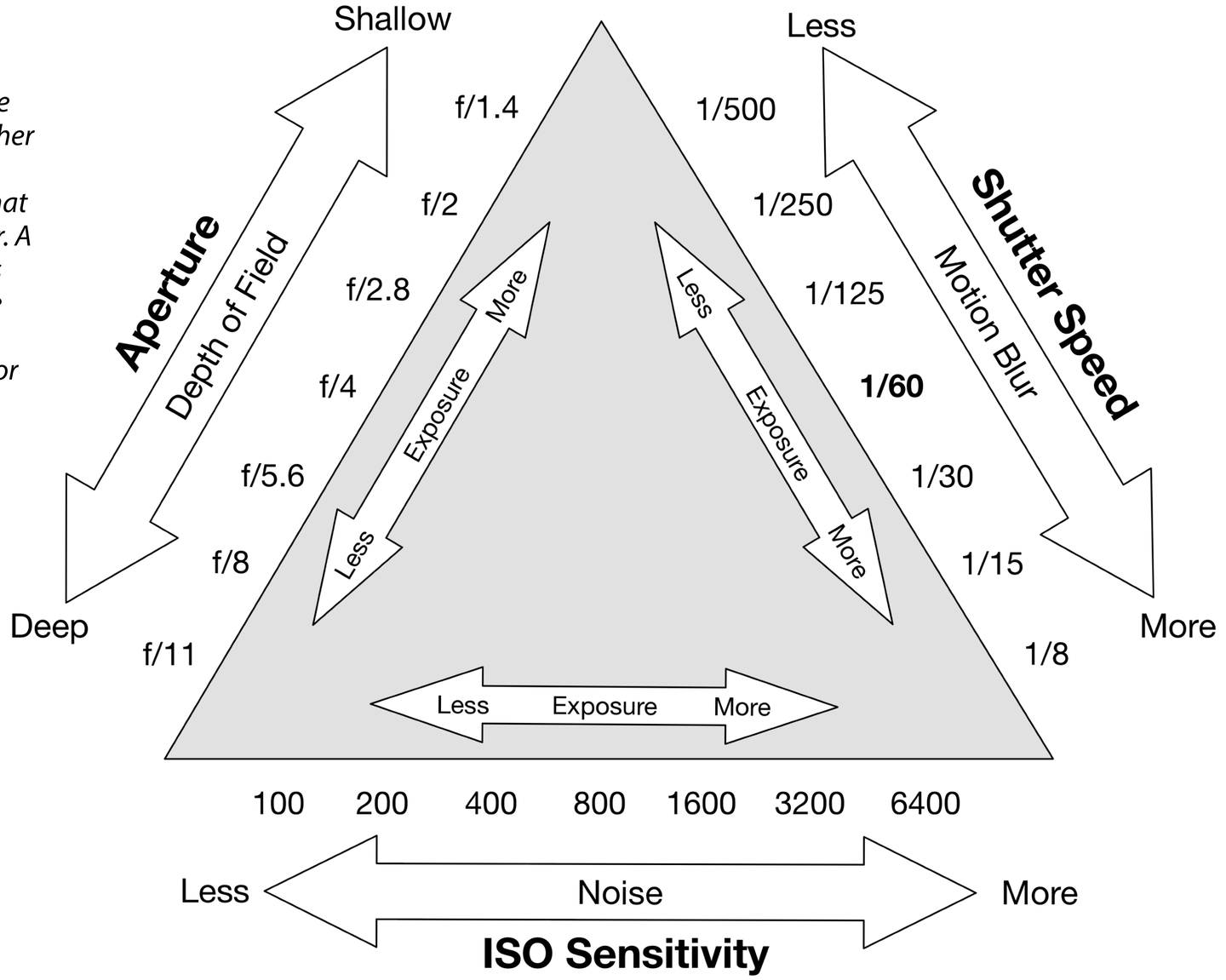
5. **Now you have manual control over exposure** by adjusting: (a) the aperture dial, (b) the shutter speed dial (though you'll want to keep this at 1/50 for "normal" motion blur), and (c) **ISO sensitivity via the multi-function dial**

REMINDER: Try to shoot with lower ISO ratings whenever possible since lower ISO settings exhibit less noise

Using the a7iii in movie mode with manual exposure

Exposure triangle (for photography)

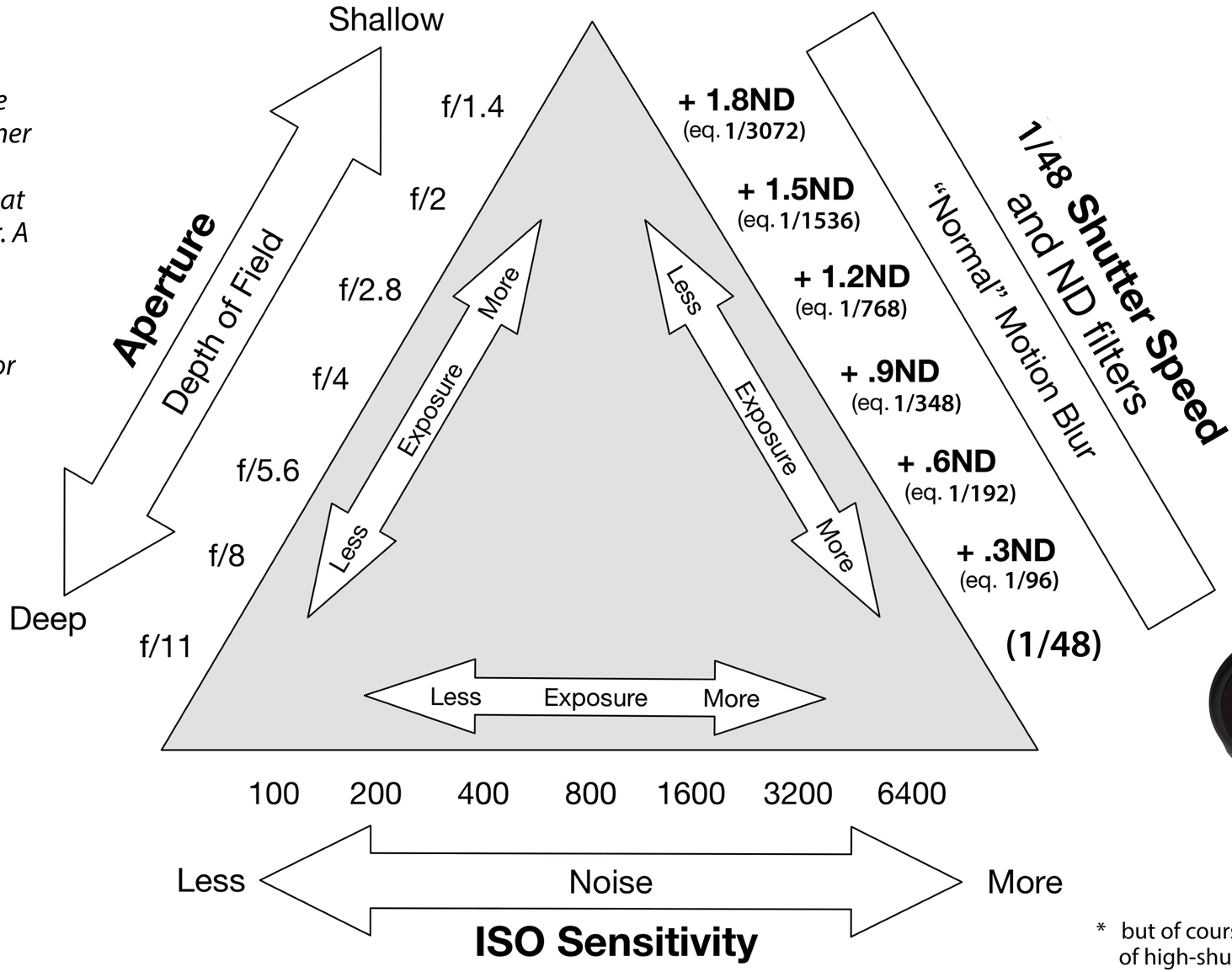
The shutter speed, the lens aperture, and the luminance of the scene together determine the amount of light that reaches the sensor. A proper exposure is determined by the amount of light reaching the sensor the sensor's sensitivity to light.

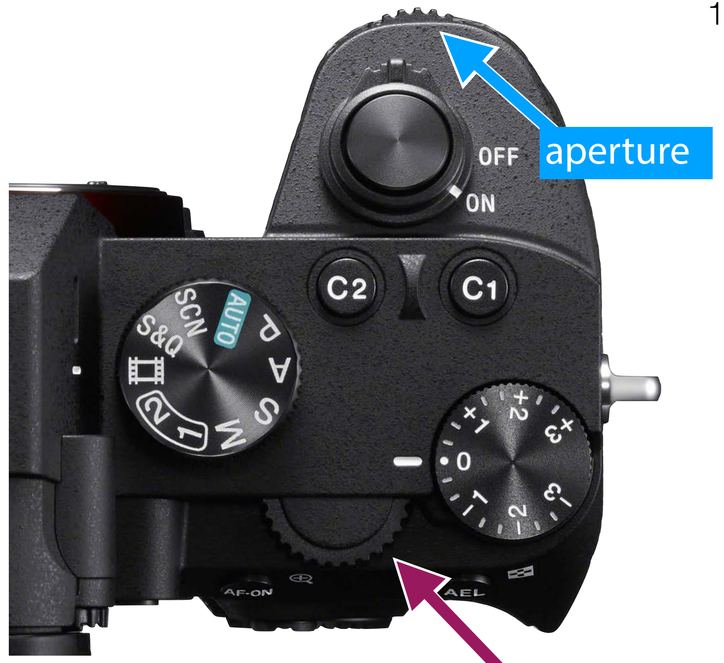


Using the a7iii in movie mode with manual exposure

Exposure triangle (for **video** recording at 24 fps (1/48) shutter speed)

The shutter speed, the lens aperture, and the luminance of the scene together determine the amount of light that reaches the sensor. A proper exposure is determined by the amount of light reaching the sensor the sensor's sensitivity to light.





⚠ when shooting 24p, set to shutter to 1/50 and don't change it!*

Use ND Filter kit instead of closing down aperture in order to maintain desired DOF

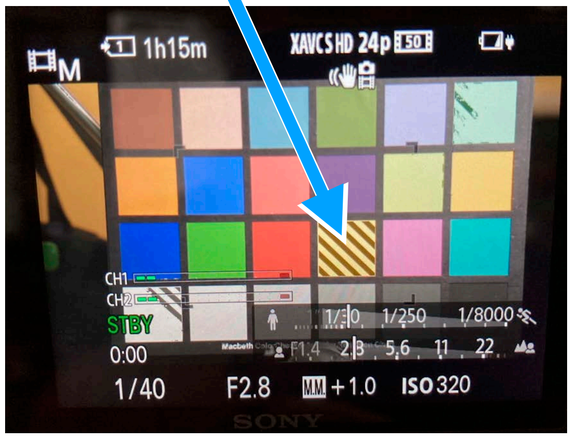
- ND8 (3 Stop)
- ND64 (6 Stop)
- ND1000 (10 Stop)

* but of course, there are always exceptions to the rule, you may want the stutter of high-shutter speeds or the excess motion blur of slower shutter speeds!

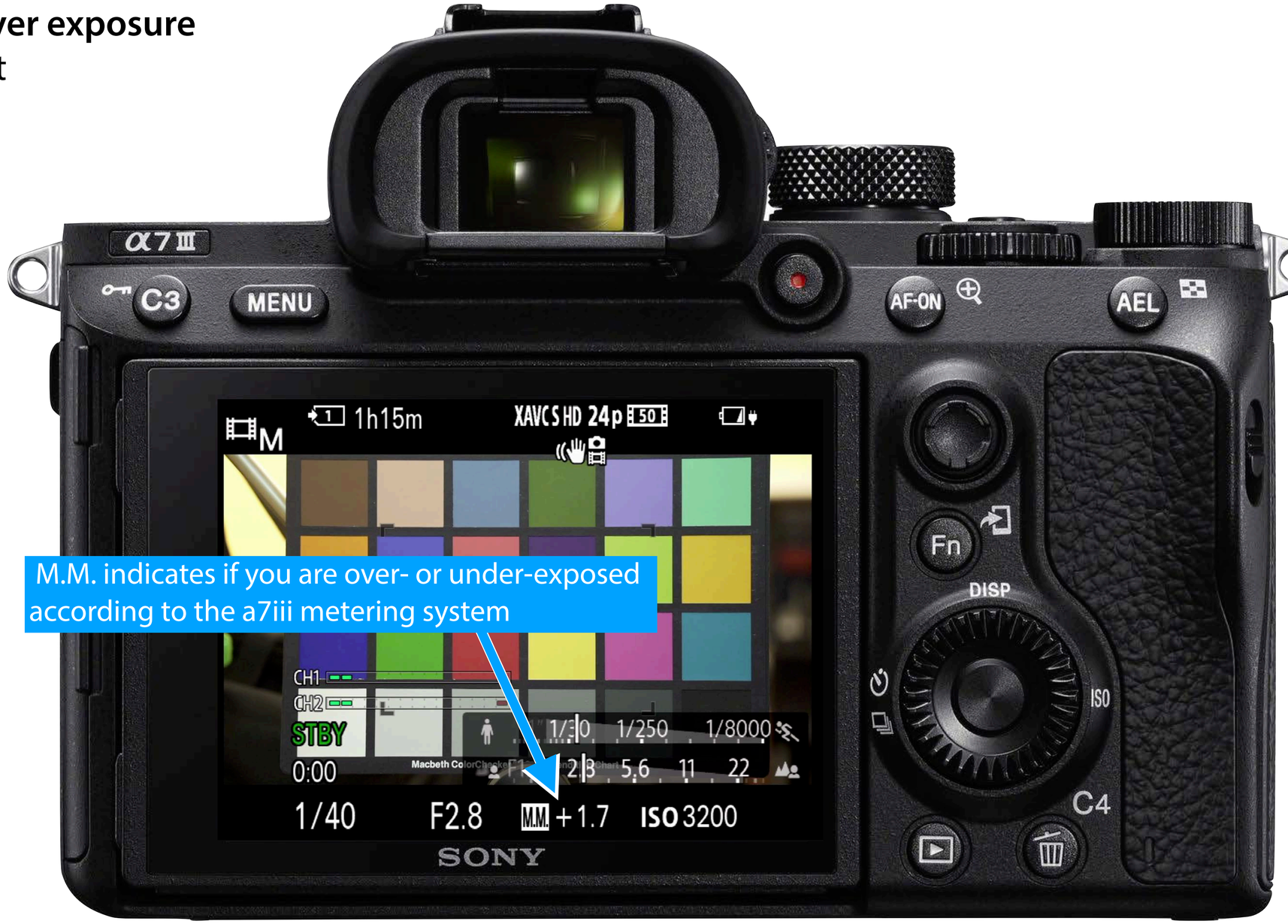
Using the a7iii in movie mode with manual exposure

5. **Now you have manual control over exposure**
   to help you determine the right exposure, use these tools:
   - **Zebras**
   - Internal Meter
     (there is also a histogram available)

areas that exceed the exposure threshold you've set will have zebra stripes over them (in this case 90 IRE)



M.M. indicates if you are over- or under-exposed according to the a7iii metering system



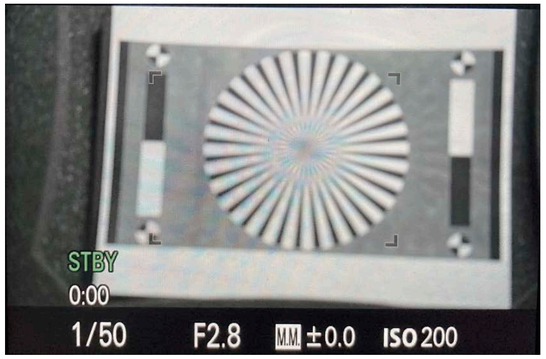
Using the a7iii in movie mode with manual exposure

6. **For maximum creative control, set focus manually**, to help you do this, **enable peaking**, a focusing aid that indicates areas of high contrast

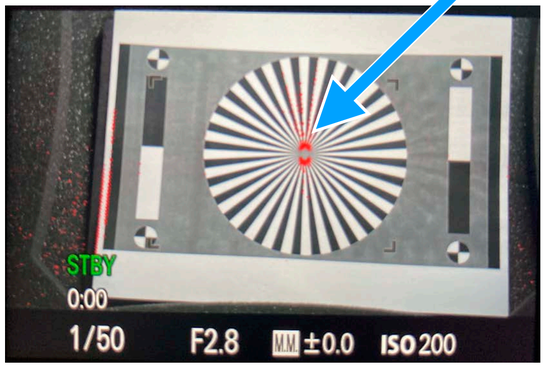
Using the a7iii in movie mode with manual exposure

6. **For maximum creative control, set focus manually**, to help you do this, **enable peaking**, a focusing aid that indicates areas of high contrast; (Camera 1 => Focus Assist (13/14) => Peaking Level => Peaking Setting => Peaking Display: On); then set Level and Color

not in focus:



in focus:

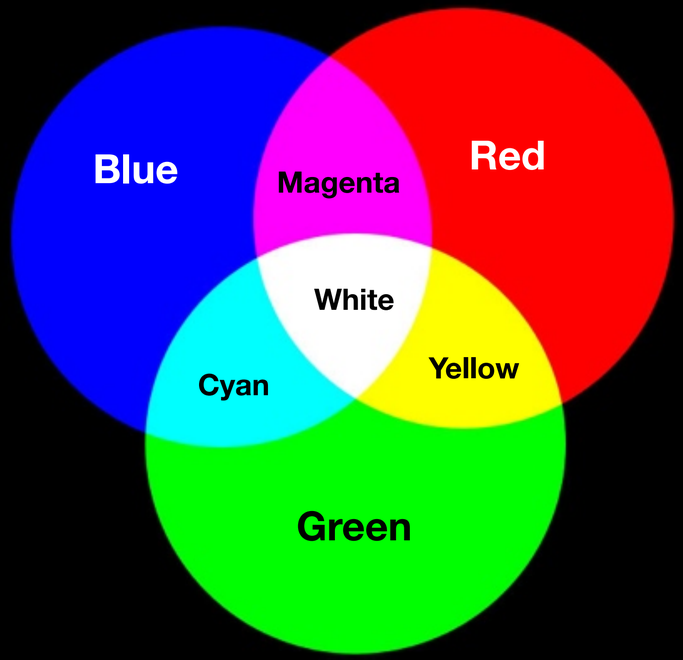


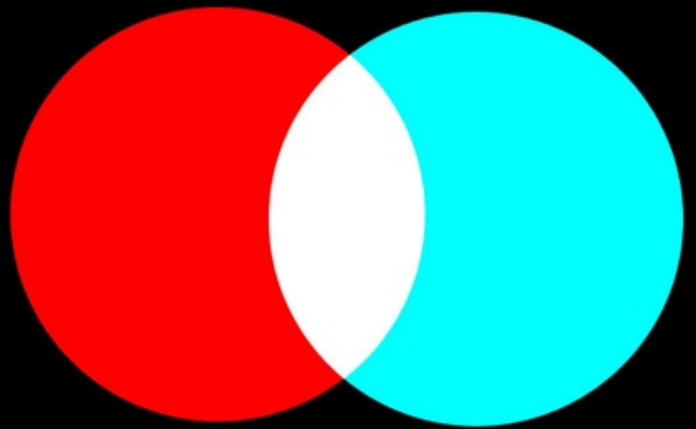
peaking

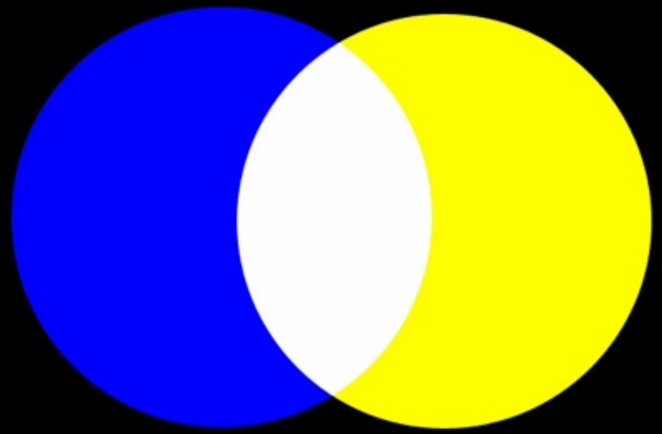
Level is a sensitivity setting; "low" will only highlighting areas of very high contrast while "high" will highlight more, lower contrast areas

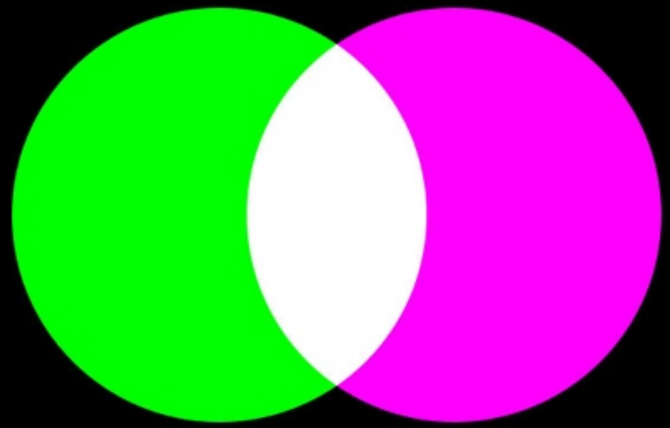
Using the a7iii in movie mode with manual exposure

Quick review of the additive color model



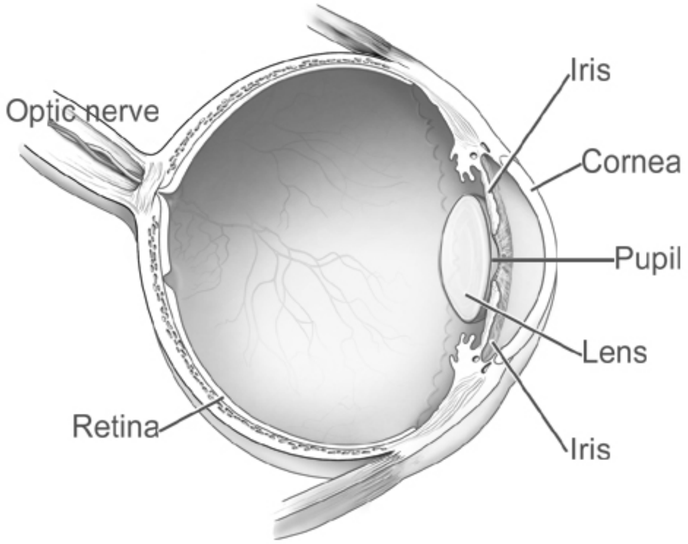


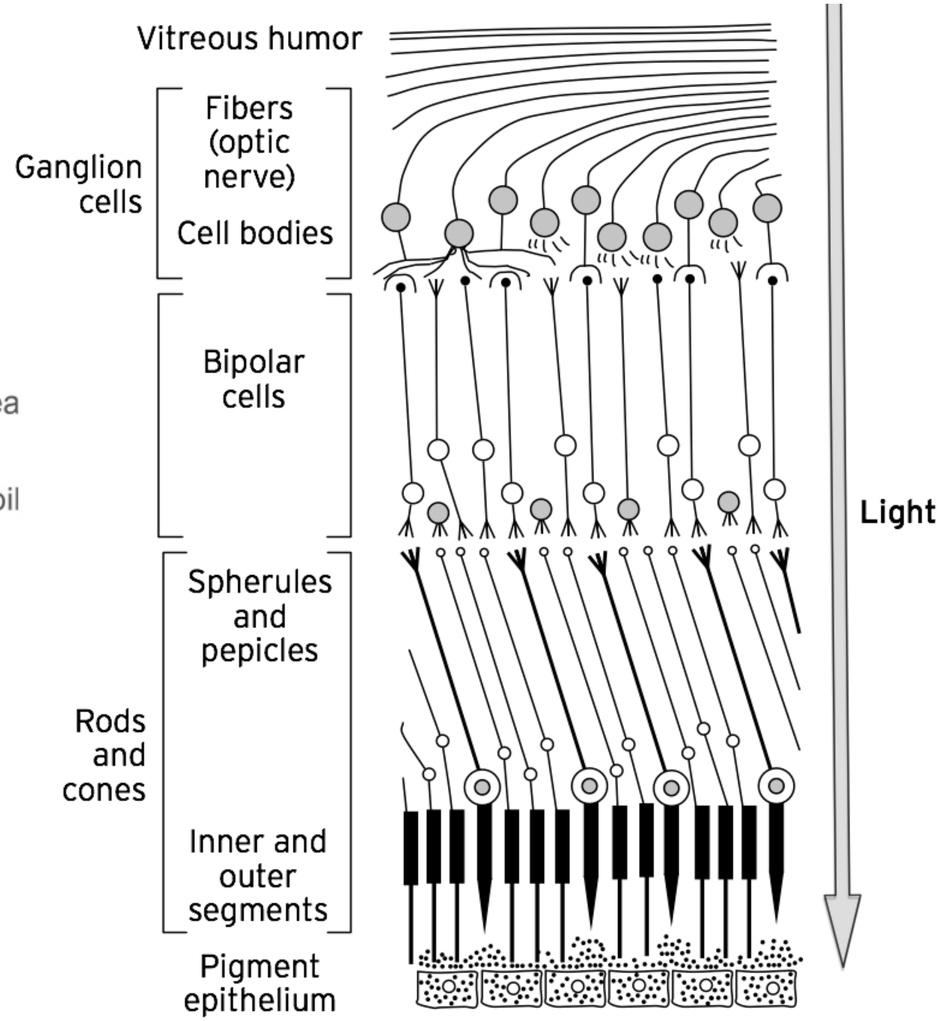


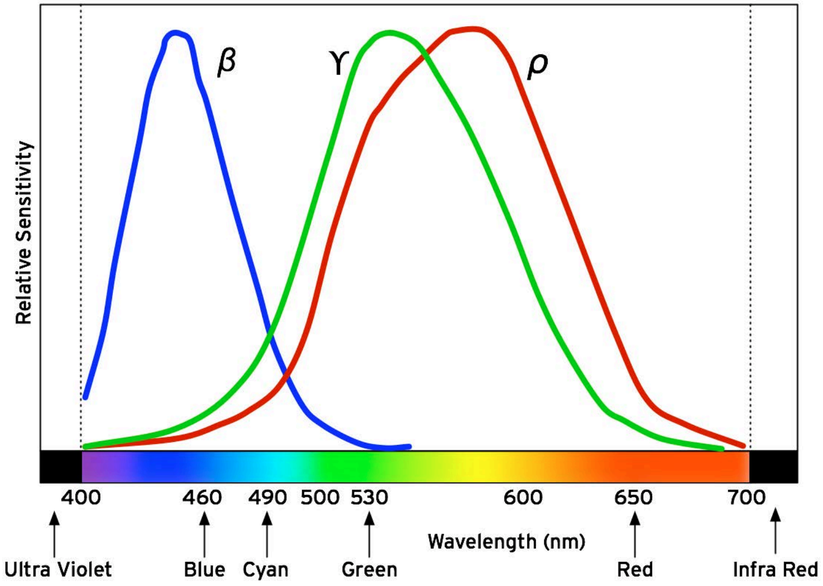


Using the a7iii in movie mode with manual exposure

color vision



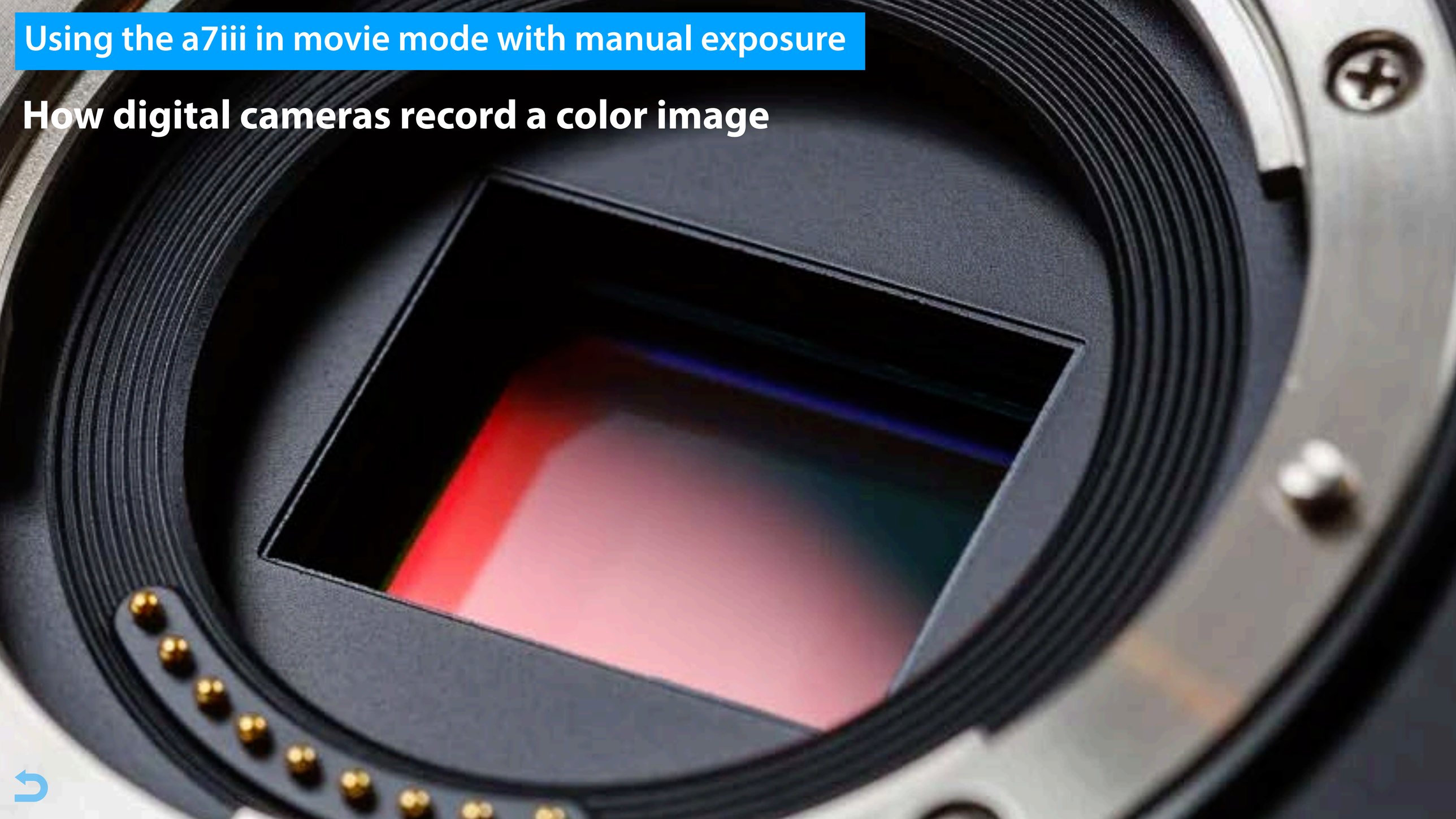




Based in part on Light and Color by By R. Daniel Overheim and David L. Wagner (Wiley, 1982)

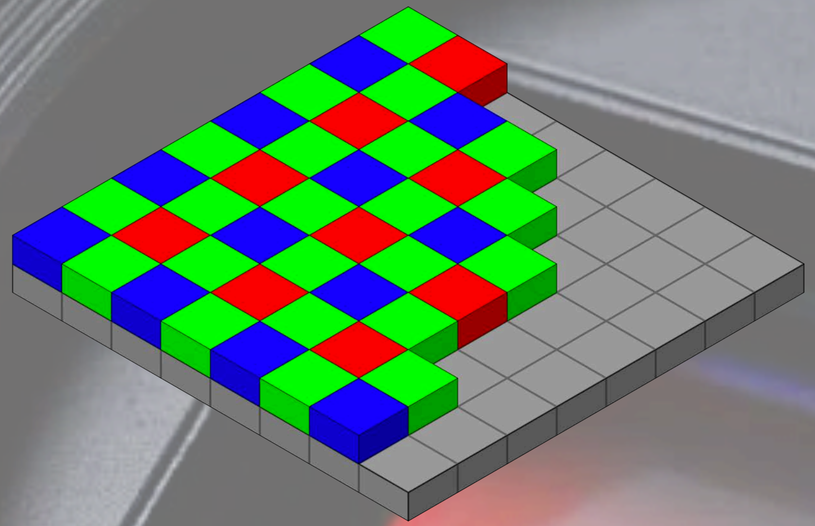
Using the a7iii in movie mode with manual exposure

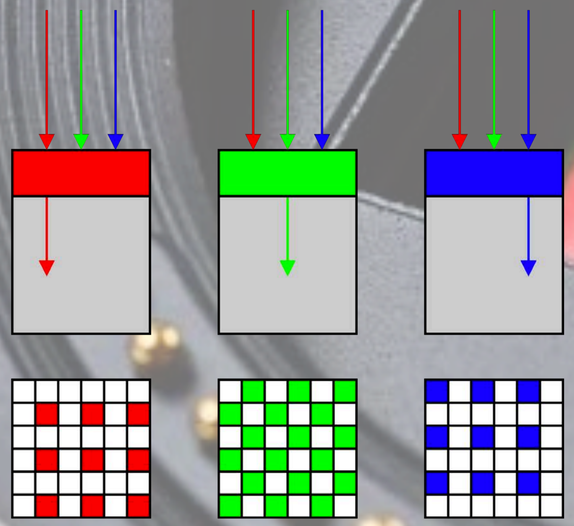
How digital cameras record a color image



Using the a7iii in movie mode with manual exposure

How digital cameras record a color image





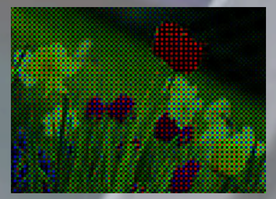
Original scene

camera **projects** image onto sensor (each pixel sensor has a color filter over it)

Bayer pattern image

image is **color coded** with Bayer filter colors based on response of each pixel sensor

Color coded image with Bayer filter colors



interpolation of missing color information reconstructs the original image

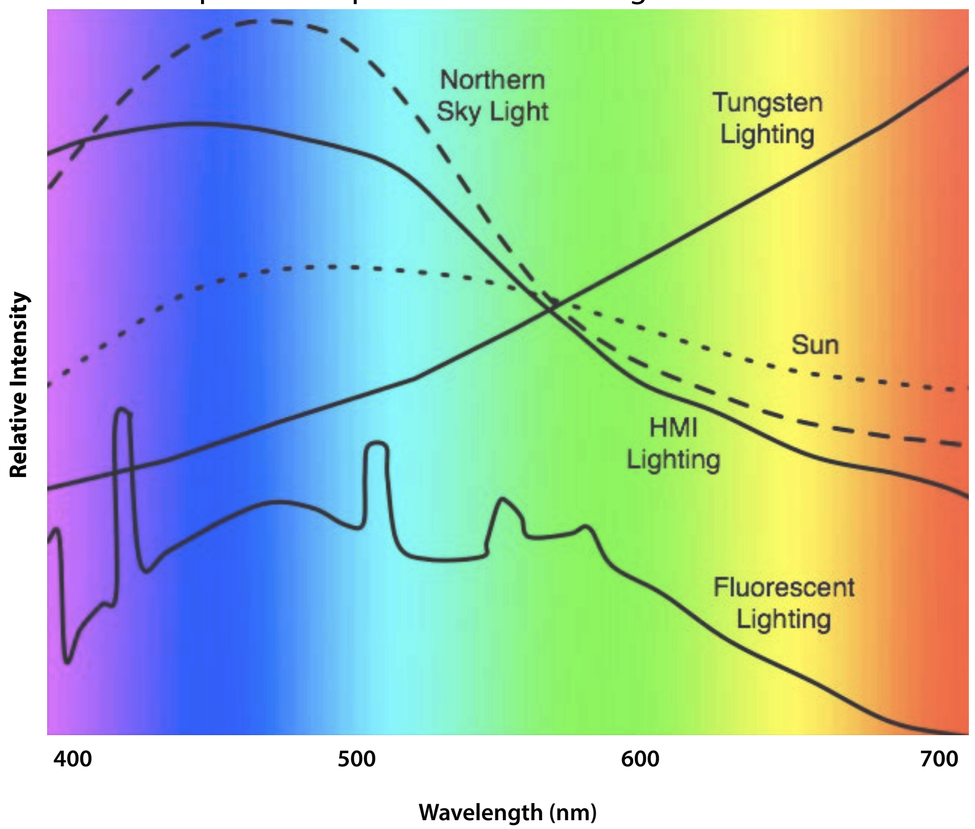
Final RGB image

Using the a7iii in movie mode with manual exposure

What is color temperature?

The **color temperature** of a light source describes the spectral response of a source that is on the line from reddish/orange via yellow to more or less white to blueish white light in units of K (degrees Kelvin).*

Spectral Response of common light sources



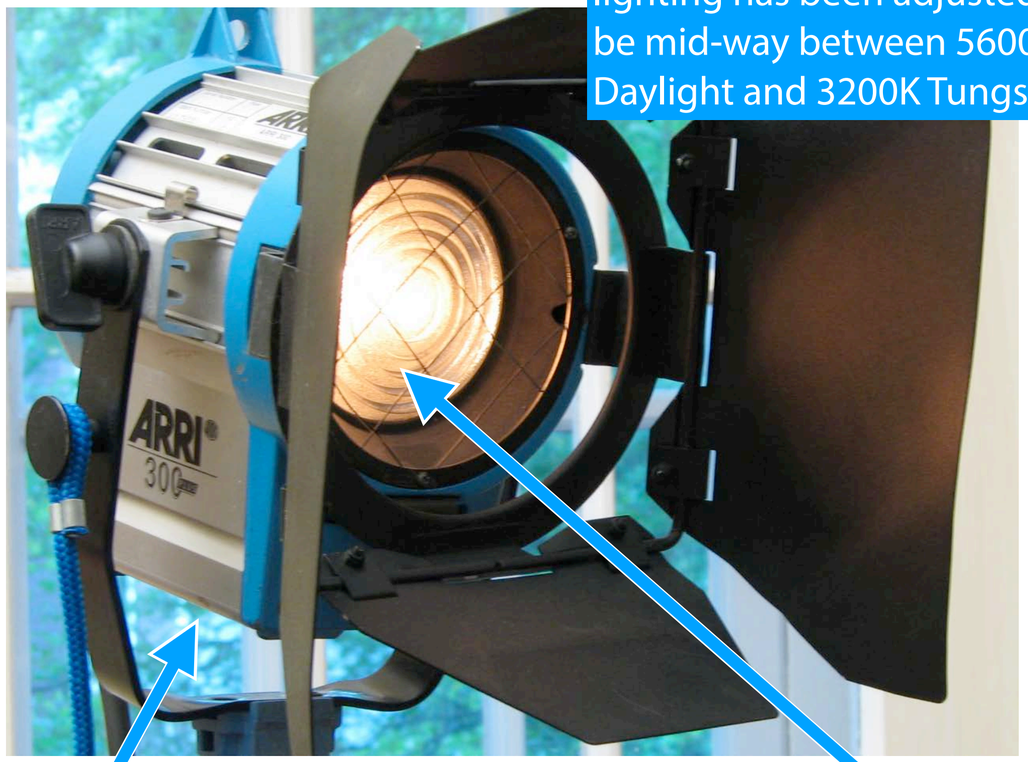
°Kelvin	Natural Light Sources		Artificial Light Sources	
10,000°				
	Summer Skylight	9,500° to 30,000°		
9,000°	Hazy sunlight	9,000°		
8,000°	Partly Cloudy Sky	8,000° to 10,000°		
	Average summer shade	8,000°		
7,000°	Light summer shade	7,100°		
	Average Summer Sky w/ blue skylight	6,500°		
6,000°	Overcast sky	6,000°		
	Direct Mid-summer Sunlight	5,800°	HMI Lamp	5,600°
	Summer sunlight at noon	5,400°	Daylight Balanced Fluorescent (Chroma 50)	5,500°
5,000°				
	Early morning & late afternoon sunlight	4,300°	Daylight Blue Photoflood Lamp	4,280°
4,000°				
	One hour after sunrise	3,500°	Photoflood Lamp	3,400°
			Tungsten Halogen bulb	3,200°
3,000°			Tungsten Balanced Fluorescent (Ultra 32)	3,200°
			Domestic electric light bulb	2,900°
2,000°	Sunrise or Sunset	2,000°		
			Candle Flame	1,850°
			Match Flame	1,700°
1,000°				

*This measure is derived from the Kelvin temperature given off by a "black body radiator" as it is heated (a theoretical lamp filament); 0° K = -273.15° C.

Based in part on *Light and Color* by By R. Daniel Overheim and David L. Wagner (Wiley, 1982)

Using the a7iii in movie mode with manual exposure

What is white balance?



In this image, ambient lighting has been adjusted to be mid-way between 5600K Daylight and 3200K Tungsten.

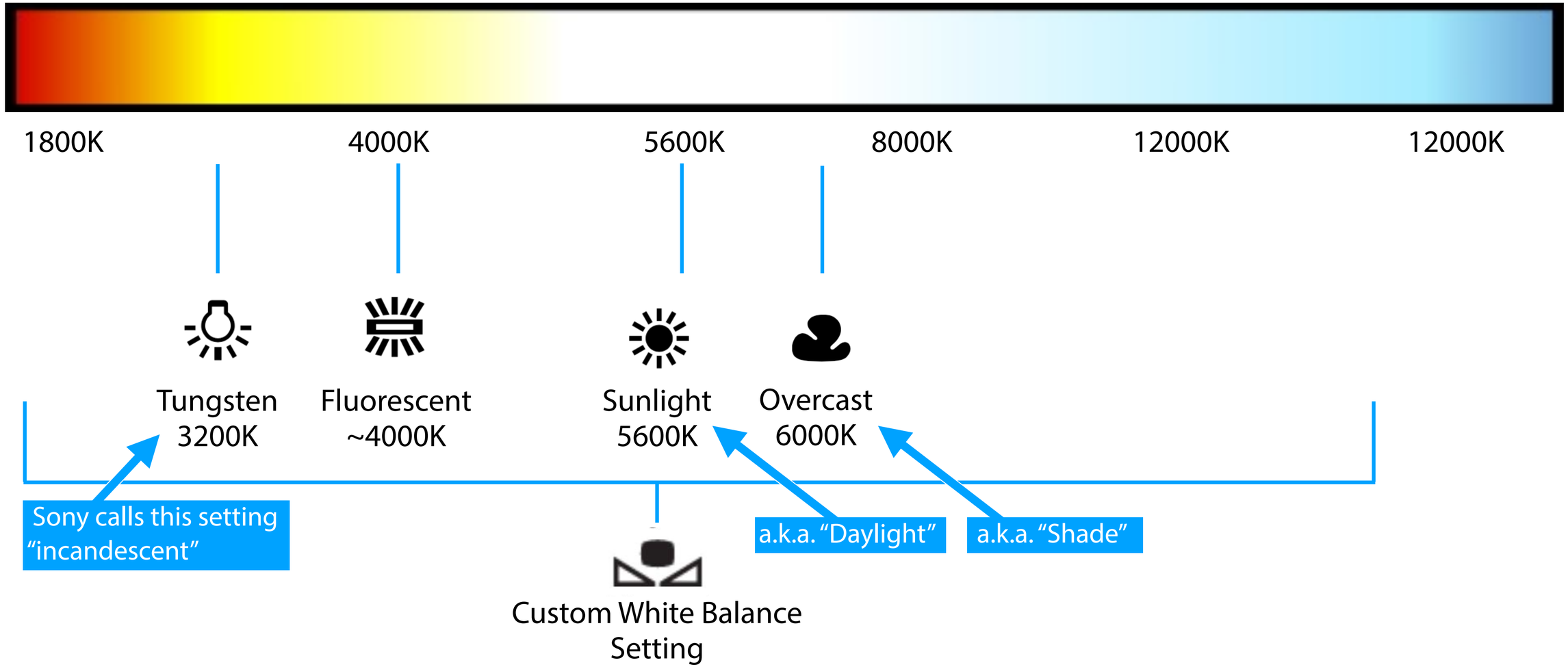
Daylight background

3200K Tungsten Light Source

The camera does not know what combination of red, green, and blue values should be rendered as white, so we need to "White Balance" the camera to tell it. This offers much better color rendering than auto white balance.

Using the a7iii in movie mode with manual exposure

Color temperature and white balance settings common to digital cameras



Using the a7iii in movie mode with manual exposure

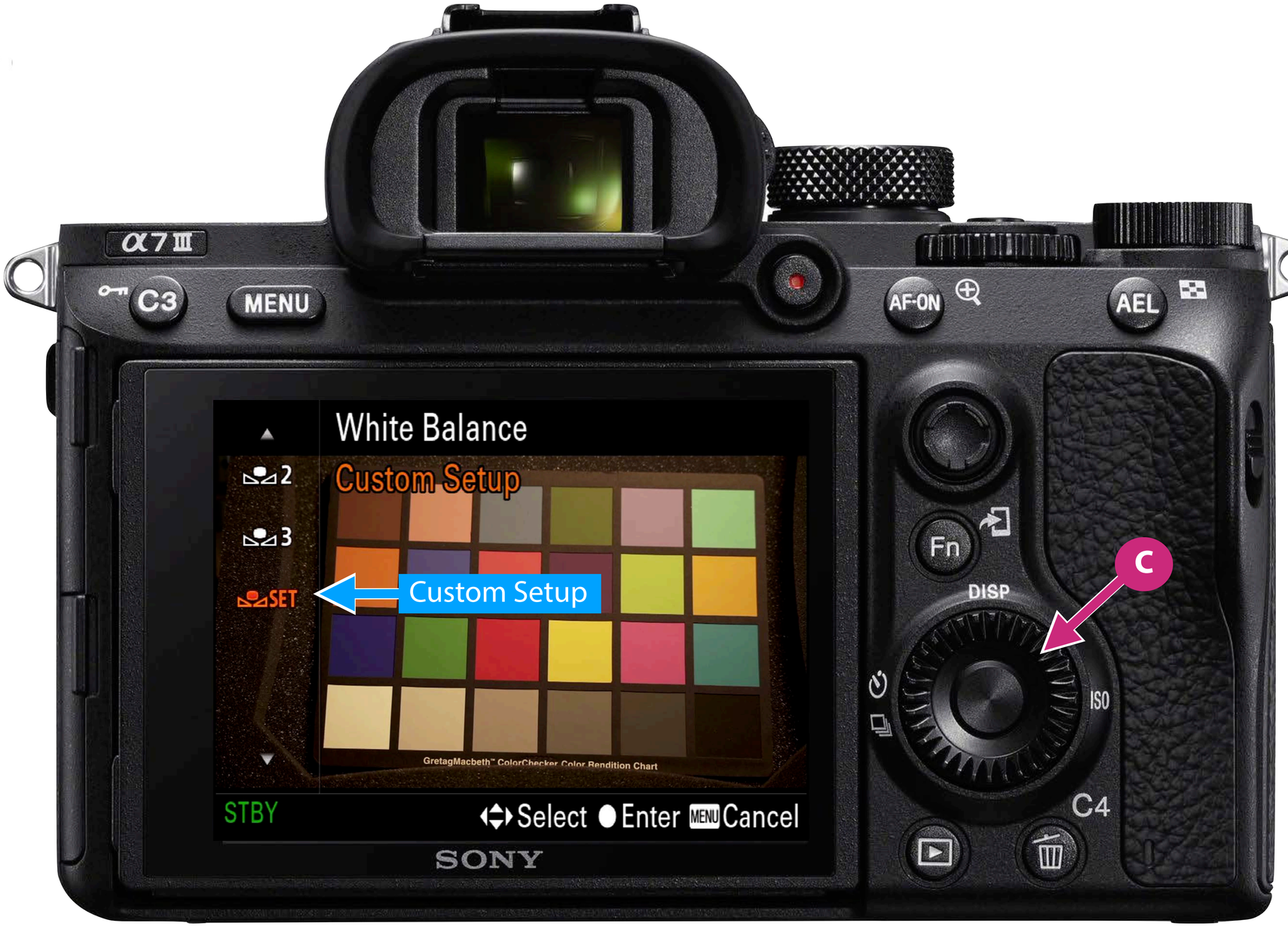
7. **Set the white balance for better color rendition** SET

Using the a7iii in movie mode with manual exposure

7. **Set the white balance for better color rendition** SET
   a. Press **Fn** to bring up the Function Menu scroll to the White Balance tile
   b. Select White Balance

Using the a7iii in movie mode with manual exposure

7. **Set the white balance for better color rendition** SET
   a. Press **Fn** to bring up the Function Menu scroll to the White Balance tile
   b. Select White Balance
   c. Scroll to Custom Setup and then press the Multi-Function select button



Using the a7iii in movie mode with manual exposure

7. **Set the white balance for better color rendition** SET
   a. Press **Fn** to bring up the Function Menu scroll to the White Balance tile
   b. Select White Balance
   c. Scroll to Custom Setup and then press the Multi-Function select button
   d. Place a white reference card in the scene and then press the Multi-Function select button to set the White Balance

Using the a7iii in movie mode with manual exposure

7. **Set the white balance for better color rendition** SET
   a. Press **Fn** to bring up the Function Menu scroll to the White Balance tile
   b. Select White Balance
   c. Scroll to Custom Setup and then press the Multi-Function select button
   d. Place a white reference card in the scene and then press the Multi-Function select button to set the White Balance
   e. Choose a register to store the setting, then press Multi-Function select button to store it

Using the a7iii in movie mode with manual exposure

7. **Set the white balance for better color rendition** SET
   a. Press **Fn** to bring up the Function Menu scroll to the White Balance tile
   b. Select White Balance
   c. Scroll to Custom Setup and then press the Multi-Function select button
   d. Place a white reference card in the scene and then press the Multi-Function select button to set the White Balance
   e. Choose a register to store the setting, then press Multi-Function select button to store it
   f. White balance set and stored in a register

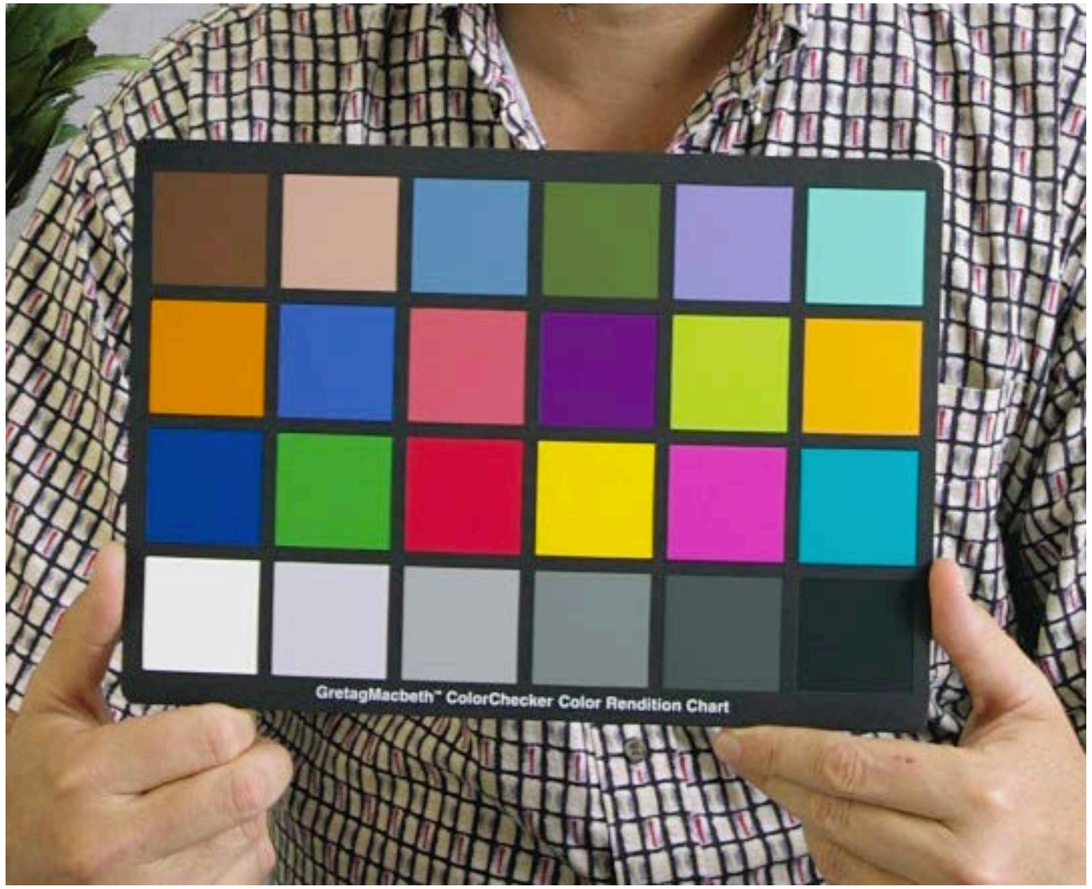
Using the a7iii in movie mode with manual exposure

7. Set the white balance for better color rendition SET

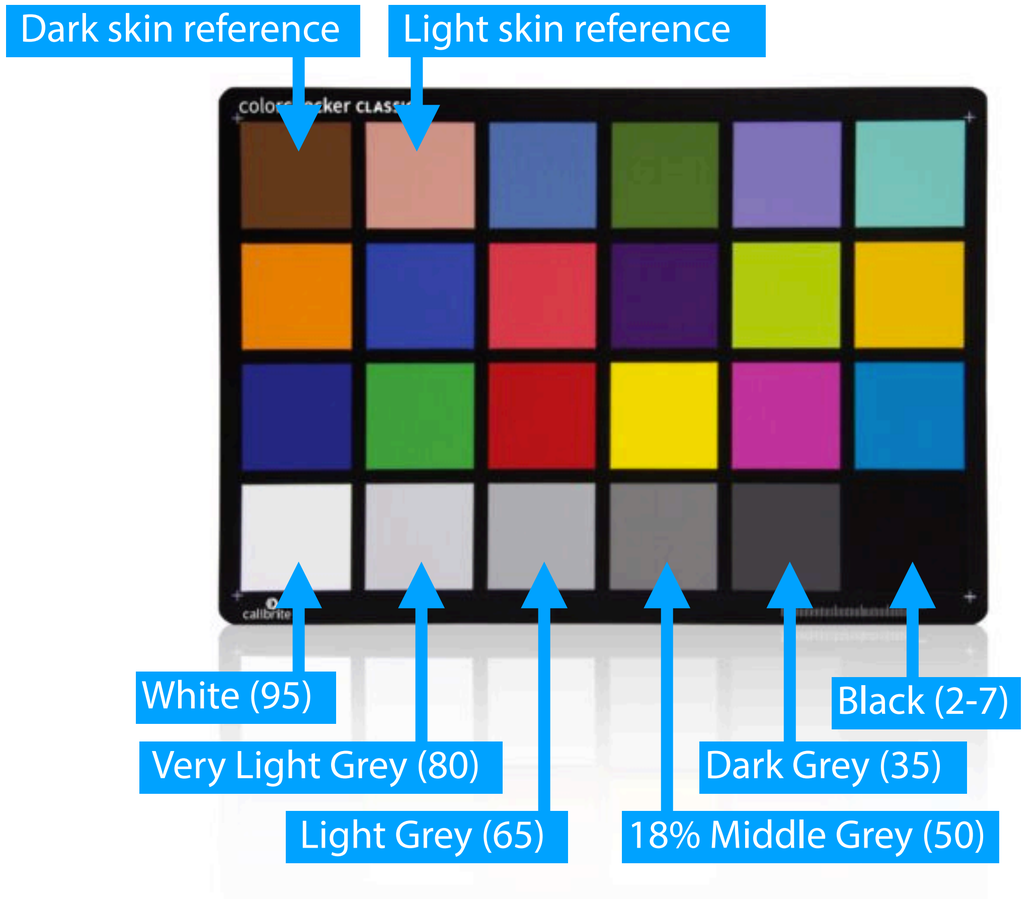
White Balance Presets and Settings	
Daylight	Fluorescent
Shade	−1 Warm White
Cloudy	0 Cool White
Incandescent	+1 Day White
	+2 Daylight
AWB Underwater Auto	
AWB Automatic White Balance	
AWB (A) AWB (Priority Set: Ambience)	
AWB (W) AWB (Priority Set: White)	
K Manual setting	
Use setting saved in Custom 1/2/3	

Using the a7iii in movie mode with manual exposure

Using a reference chart to understand color rendition



(PD)



Software Support:

- Adobe Photoshop and Adobe Lightroom via a free plugin
- Black Magic Design DaVinci Resolve for color grading
- 3DLUT Creator
- and others

See also ColorChecker, https://en.wikipedia.org/wiki/ColorChecker
See Color Checker, Calibrite, https://calibrite.com/us/product/colorchecker-classic/

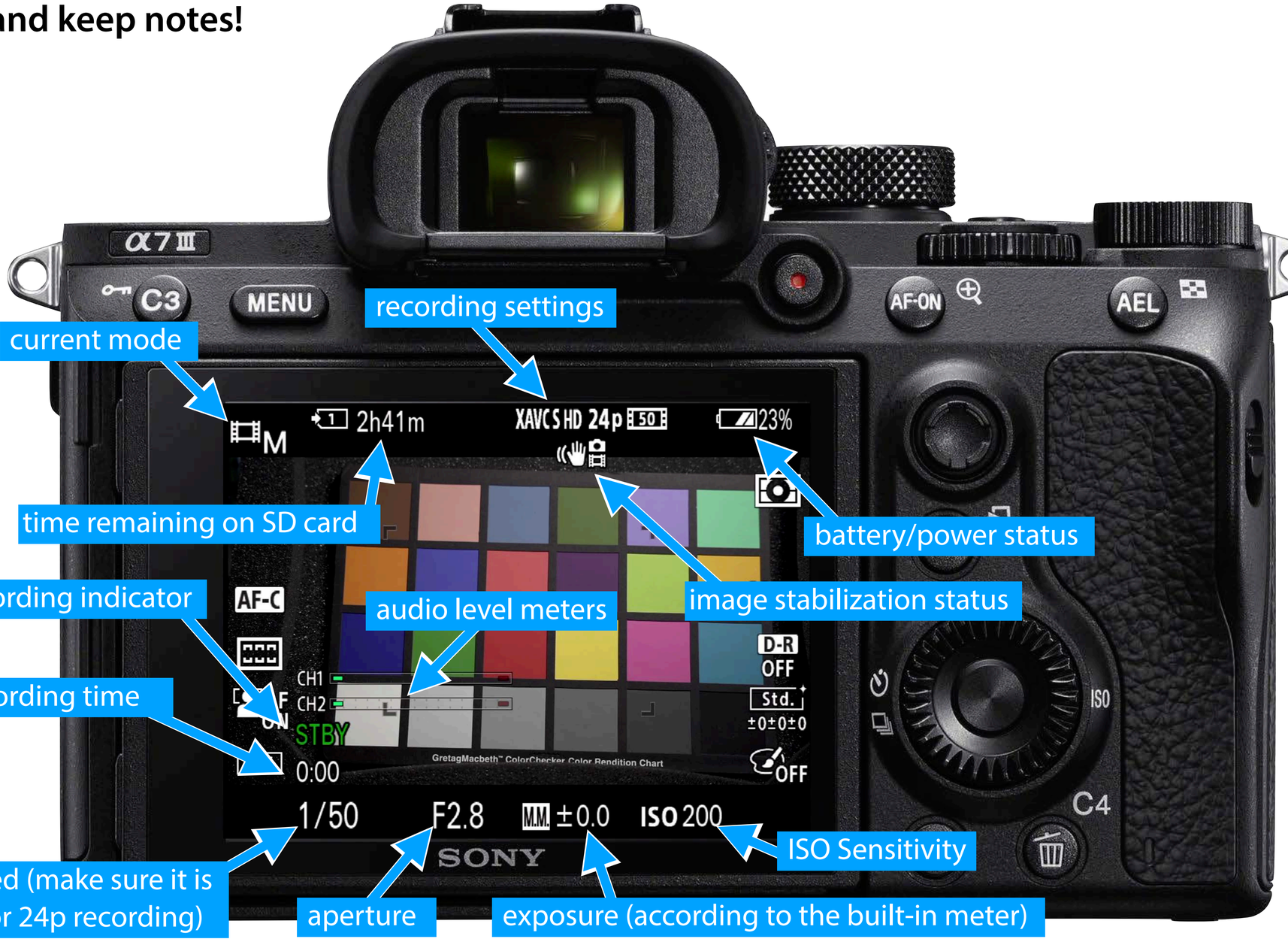
Using the a7iii in movie mode with manual exposure

8. Record video, experiment, and keep notes!

Notes:

- In Movie Mode audio levels are manually adjusted
- Image stabilization is enabled by default
- Camera may be powered via USB-C as well as battery
- Recording in progress indicated by REC on the LCD, otherwise it is STBY

Turn off the camera when not shooting to conserve battery power



Getting started with the a7iii

Hands-on activity — interpret the prompts any way you like, preserving their spirit, have fun!

For this workshop shoot HD/24p VIDEO in P mode w/ auto-focus; experiment with touch focus and exposure compensation.

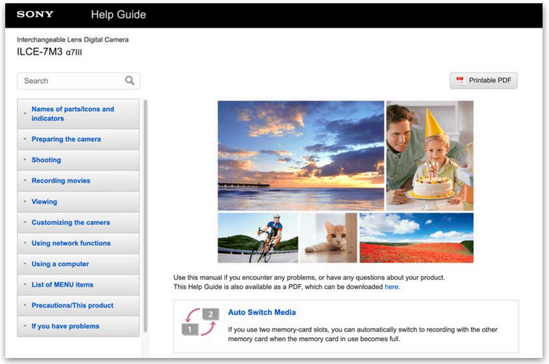
Shot List (listed in the printed handout)

Sony a7iii Camera Kit Introduction Workshop

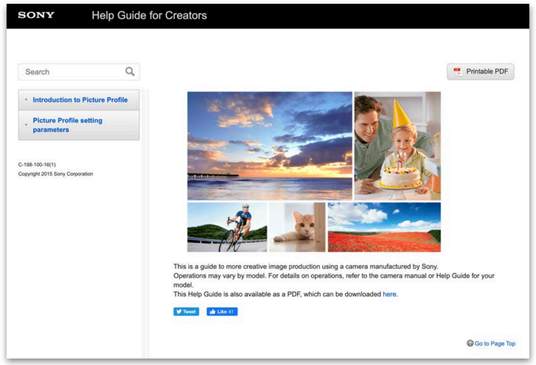
5. Resources for Further Study

5. Resources for Further Study

Sony a7iii resources available from Sony



Sony a7iii Camera Help Guide
https://helpguide.sony.net/ilc/1720/v1/en/index.html

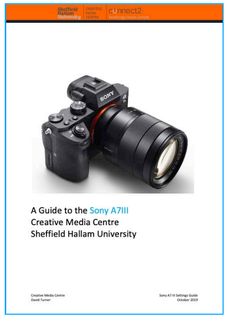


Sony Help Guide for Creators
https://helpguide.sony.net/di/pp/v1/en/index.html
Covers Picture Profiles

Sony a7iii Instruction Manual (PDF)
https://tinyurl.com/sony-a7iii-manual

5. Resources for Further Study

Sony a7iii resources available from third-parties



Sony a7iii Camera Settings (PDF)
(Sheffield Hallam University, **https://connect2.shu.ac.uk/self-help/cmcbookings/forms/Sony_A7III_Settings_Guide.pdf**

Sony a7iii Camera Kit Introduction Workshop

6. Additional Topics

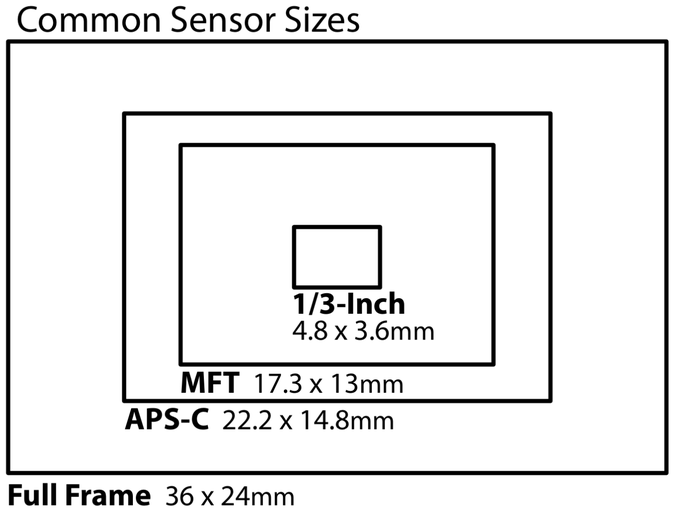
Additional topics: Using the a7iii with an external monitor

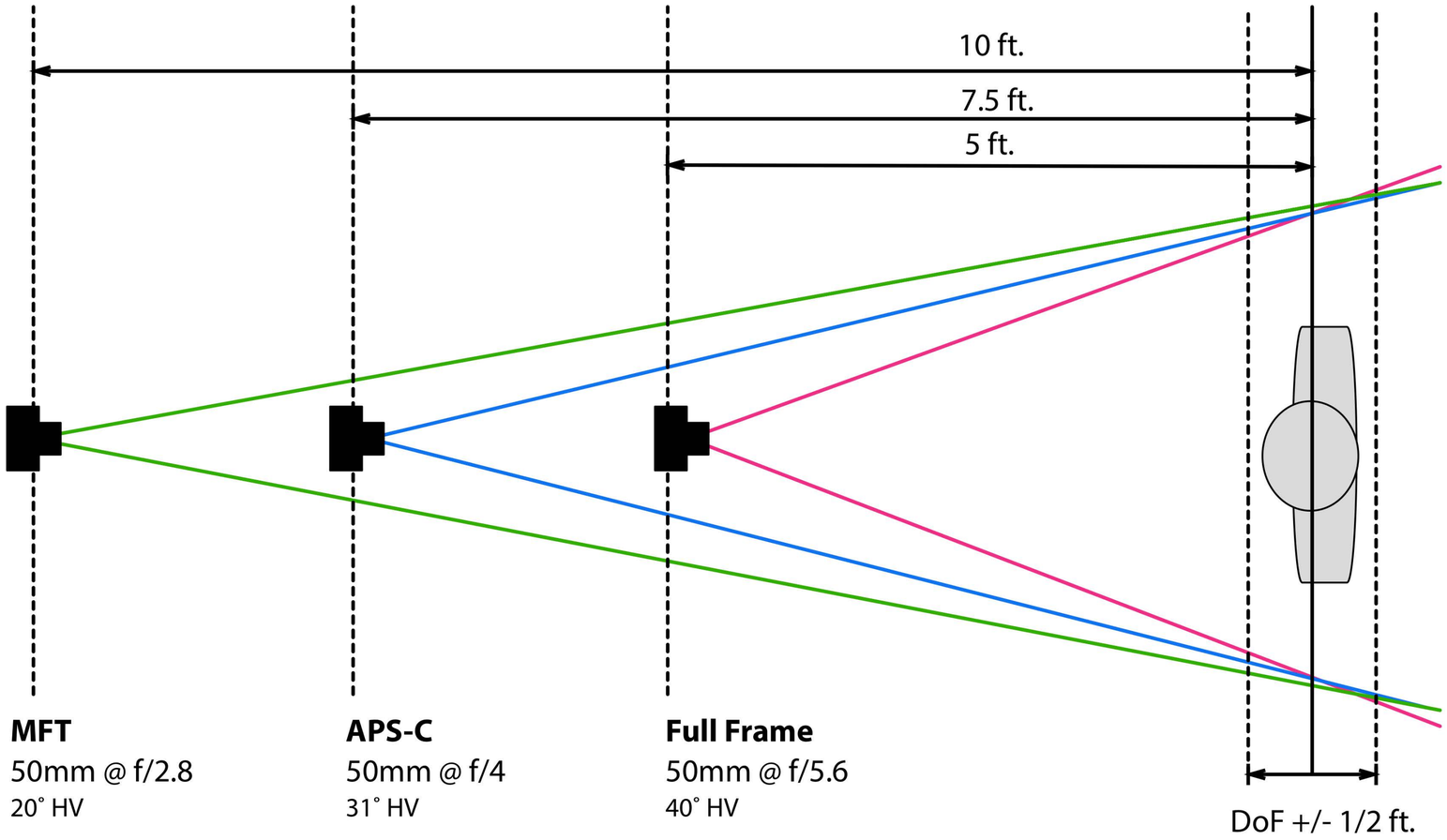
Connect an external monitor via the micro-HDMI connector

- The camera LCD will go blank when using an external monitor via HDMI output under several circumstances, see https://www.sony.com/electronics/support/articles/00120915 for a complete list of scenarios.

Additional topics: Sensor size comparison

Sensor size does not have an effect on depth-of-field, however, what we consider a "normal" lens is determined by sensor size, therefore, a "normal" lens for a camera with a Micro Four-Thirds (MFT) sensor like the Panasonic GH5 is **25mm**, while a "normal" lens for a **full-frame** camera like the Sony a7iii is **50mm**. What full-frame cameras make possible in comparison to smaller sensor counterparts is shorter camera to subject distances when shallow depth of field is required. There is more to this, of course…





See the Depth of Field Calculator at http://www.dofmaster.com/dofjs.html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