CD 222
AUDIO AND VIDEO PRODUCTION
LECTURE 5

Audio System

- Audio system is integrated equipment for producing amplified sound.
- a audio system is comprised of three basic components: source, amplification, and speakers.

Audio sources

- Source components are more important than you would ever think because the final product (sound quality) depends on them a lot.
- The sources of audio content are numerous and they can be differently categorized.
- For example, you can use an external source (a CD/DVD player, a turntable or a receiver with a built-in AM/FM tuner) or you can choose to stream the music from your phone via Wi-Fi or Bluetooth connection.
- Also, the source components can be grouped as digital or analog sources.
- CD/DVD players would belong to the digital group while phonographs and turntables would be considered analog components.

Cont..,

- People usually think that the source is not as important as the speakers but speakers can't make miracles if you're playing a poor-quality track.
- CD players are usually considered the best sources but if the CD quality is poor, you can't do much to fix the final product.
- However, they are less complicated than tuners and turntables so we will consider them relevant.

Cont..,

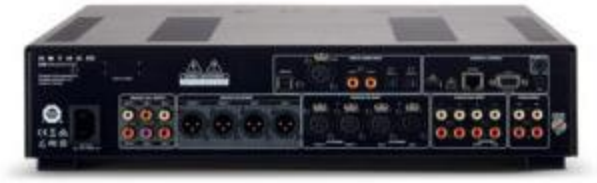
- Every CD player consists of a transport component that drives the disc, DAC (digital-analog converter) that converts the digital signal (the bits) into analog, and an amplifier.

- Many people think that CDs belong to the past and that's why we have to consider online sources, as you can play the music directly from the Internet or you can download it to your phone/iPod/PC storage.
- It is very important to mention that MP3 files (or any other lossy file format) can't offer high-quality audio no matter how much you try.
- On the other hand, you can always download some of the lossless files (such as FLAC and ALAC).
- This will definitely help if you want high-quality audio.

Amplifiers

- They can be divided in two groups
  i. standard stereo receivers
  ii. integrated receivers.
- Any standard/traditional stereo receiver contains at least a
  - radio tuner,
  - a pre-amplifier (that receives the signal from the source and adjusts it so that a power amplifier can recognize it),
  - the power amplifier (which accepts the signal sent from the pre-amplifier and adjusts it in order to drive the speakers)
  - a phono pre-amplifier (that recognizes and receives very low-level signals).

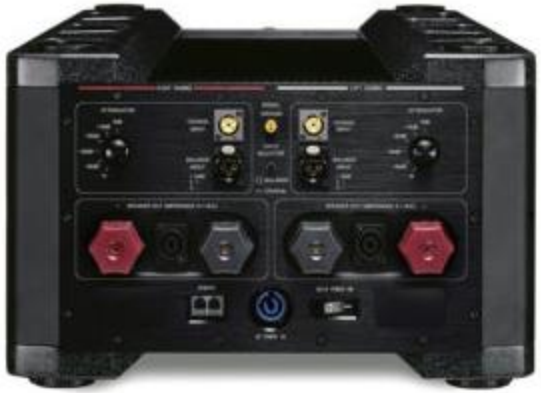
Pre-amplifier



- Pre-amplifier is the first component that receives the signal coming from the source and transforms it to the level where the power amplifier can recognize and receive it.
- This component is very important because it enables the user to control the volume, switch between the source components and control the gain stage.
- People usually don’t consider pre-amps very important but they are the components that enable the power amp (as well as the speakers) to perform much better,
- usually improving the bass or resolution.
- This component passes a very small signal to the power amp but all the distortions and imperfections that it doesn’t solve are re-amplified by the power amplifier and as a result, we get distorted sound.
- This is why a high-quality pre-amp is the very important part of every stereo system.

Power Amplifier

- The power amplifier is usually the most respected amplifier component because it receives the signals from the pre-amp and uses them to drive the speakers.
- During the process, it controls the signal accuracy and eliminates the imperfections and distortions.
- You can find different kinds of amplifiers on the market but there's a great difference between consumer and high-end amps.



Cont..,

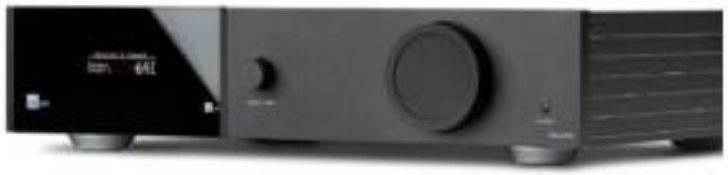
- Quality amplifiers don’t have to produce 5000 W.
- High-end amplifiers can produce 30 or even 10 W but when they are matched with a great pair of speakers, the produced power won’t affect the final result in a negative way.
- It is actually all about the current.
- The amplifier modulates the current running through the system and eliminates the imperfections.
- Quality amplifiers tend to deliver much more current than consumer amps and enable better speaker control during the process.

Phono Pre-amplifiers

- Phono pre-amplifiers aren't mandatory parts, but you can find them in some amplifiers.
- Their task is to recognize and receive extremely low-level signals and amplify them to the level where the pre-amplifier can receive them for further processing.
- You may not need them when playing music from CD players but they do a very important job when the music is played from turntables.
- Also, these components are just a box without any visible controls (control buttons) such as volume or power on/off switches but they help control the gain.

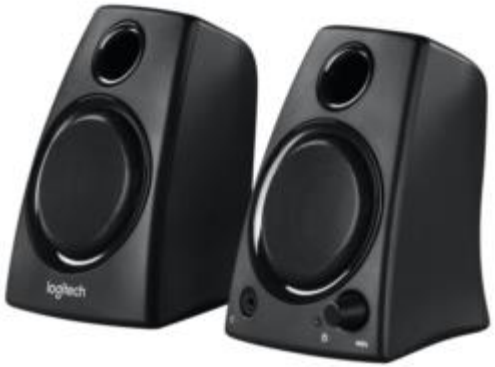
Integrated amplifiers

- Integrated amplifiers are similar to receivers but they don't have AM/FM tuners.
- They can be as large as standard receivers and they also have all the parts placed inside one box.



Stereo Speakers

- Some people consider speakers the least important part of the system while the others say they are the most important and that everything depends on them.
- We will agree that they are very important but they are also ‘’the most passive component’’ and they can’t make your music sound amazing if all the other components are bad.



What is an integrated amplifier vs a receiver?

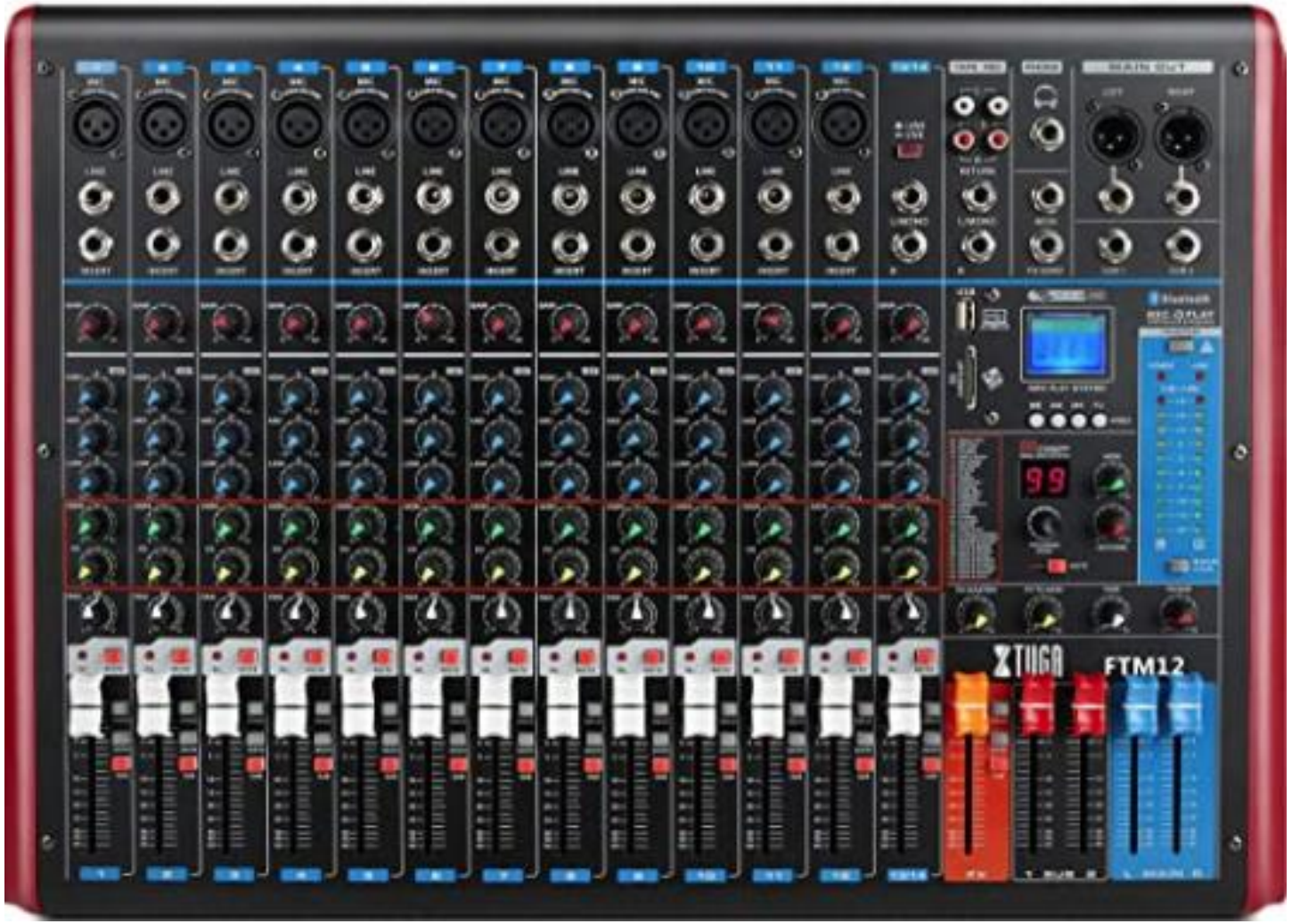
- An integrated amplifier is a preamplifier and a power amplifier in one cabinet.
  - It can be any number of channels, just like a receiver can be any number of channels.
- A receiver is a tuner, preamplifier, and a power amplifier in one cabinet.
  - There are also some tuner/preamp combinations, without power amplifiers.

Mixer

- The mixer is an essential item in live music, and also in many studios.
- It is also one of the bits of audio gear that seems to intimidate those who are unfamiliar, due to the seemingly endless controls.
- It’s all far more straightforward than it looks.

Cont..,

- A mixer (sometimes known as a mixing desk, mixing console, mixing board, desk or console) takes various audio sources through its multiple input channels,
- adjust levels and other attributes of the sound,
- then usually combine them to a lesser number of outputs.
- this might involve taking the audio from performers in a live situation, tweaking and adding effects, then combining these to a stereo or mono output which can be amplified with a PA system.


XTUGA
FTM12

Exercise

- Explain how mixer works?
- Discuss all mixer controls available.

Video Systems and Production

Types of Camera

- Compact Cameras.
- DSLR Cameras.
- Mirrorless Cameras.
- Action (Adventure) Cameras.
- 360 Cameras.
- Medium Format Cameras.
- Traditional Film Cameras.

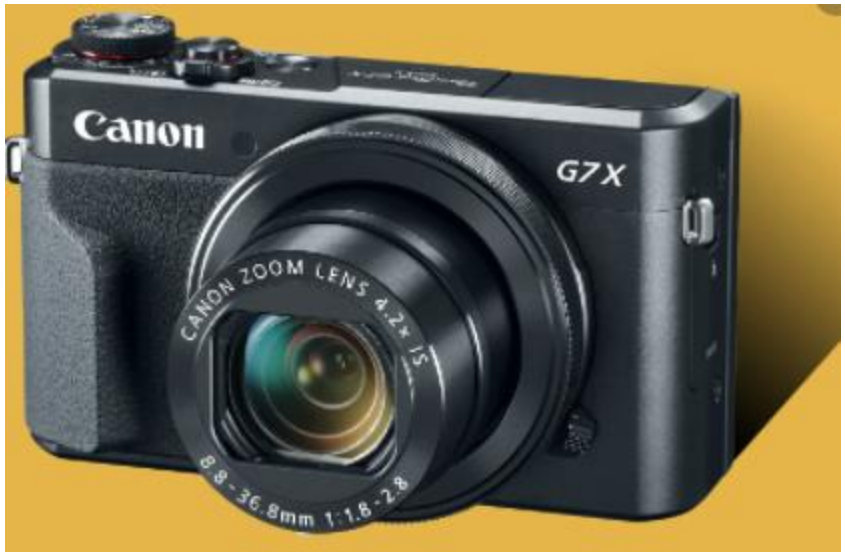
Compact Cameras

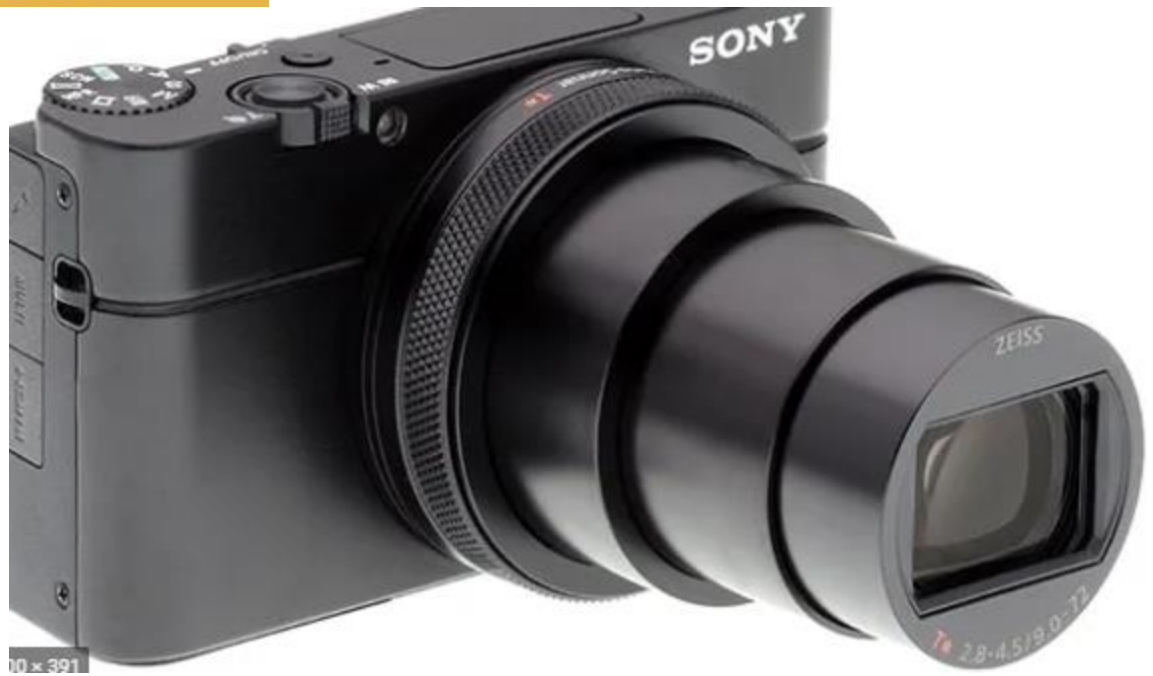
- They offer no real adjustable camera settings, but are incredibly affordable.
- They're light-weight,
- easy to use,
- you just point and shoot.

❖Pros and cons

- **Pros**: User-friendly, compact and light, affordable, no extra lenses needed
- **Cons**: Uncustomizable camera settings, limited aperture, limited zoom range, small sensor creates more noise, slower focus

➢**Recommendations:** Canon Powershot Elph 190is (Standard), Panasonic Lumix TZ200 (Zoom), Canon PowerShot G3X (Advanced)


Canon
G7X
CANON ZOOM LENS 4.2x IS
8.8 - 36.8mm 1:1.8 - 2.8


SONY
ZEISS

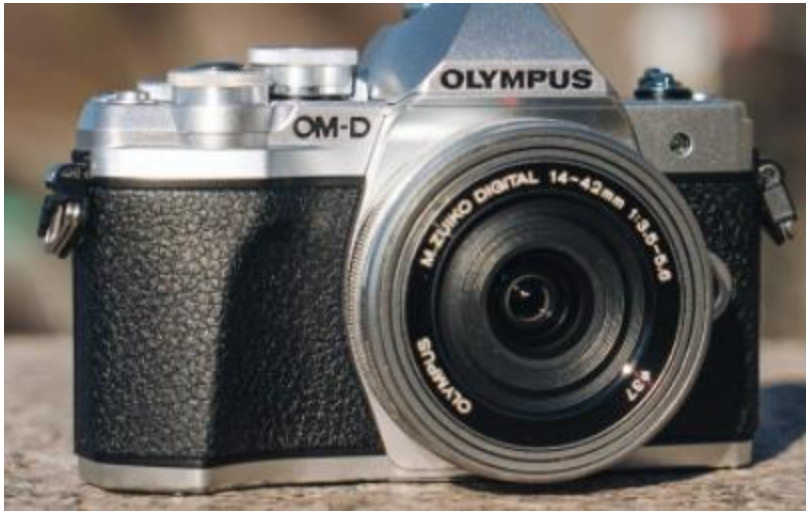
DSLR Cameras

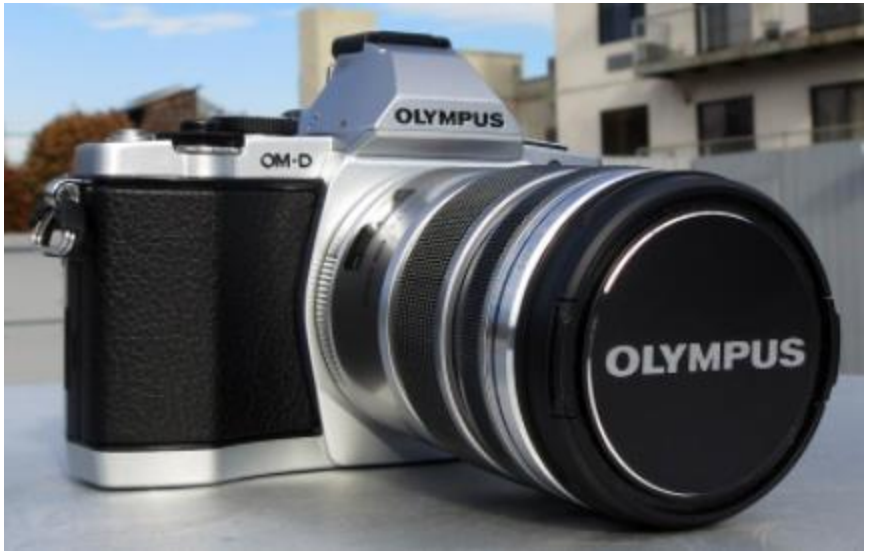
- Digital Single Lens Reflex (DSLRs) are the go-to cameras for most creative.
- Find this camera works for any project.
- They deliver exceptional, professional-level sharpness and even incredible background.
- Videos are in high resolution due to DSLRs advanced sensors, manual camera settings, and interchangeable lenses.
  - **Pros**: Optical viewfinder, completely customizable settings, high res photo and video output, variety of camera body types and lenses, larger sensors provide better image quality
  - **Cons:** Bulky, can be expensive
- Recommendations: Pricier options: Nikon D850, Canon EOS 5D Mark IV, Affordable: Canon EOS Rebel T7i


Nikon
D610

Mirrorless cameras

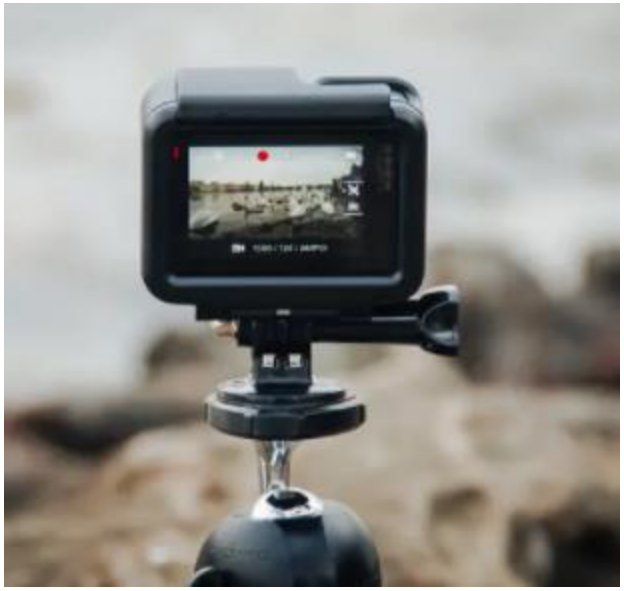
- Mirrorless cameras are a lighter, more compact alternative to the DSLR, and provide incredible quality images, especially video.
- The camera body lacks a mirror that reflects light to the sensor, instead the light goes straight to the sensor.
- The very mechanics of the mirrorless automatically limit camera shake as compared to the DSLR.
- And with less moving parts, they're quieter than DSLRs.
  - **Pros:** light-weight and compact, quieter, no camera shake, reliable video mode, simpler controls, electronic viewfinder, lower price point
  - **Cons:** Shorter battery life, slow autofocus, less lenses available
- Recommendations: Canon EOS M50, Sony a7R III

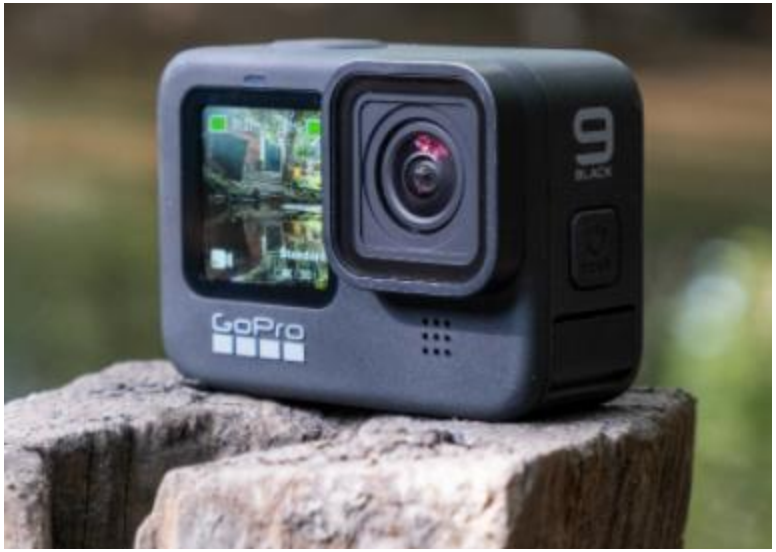

OLYMPUS
OM-D
M.ZUIKO DIGITAL 14~42mm 1:3.5~5.6
OLYMPUS
ø37


OLYMPUS
OM-D
OLYMPUS

Action (Adventure) Cameras

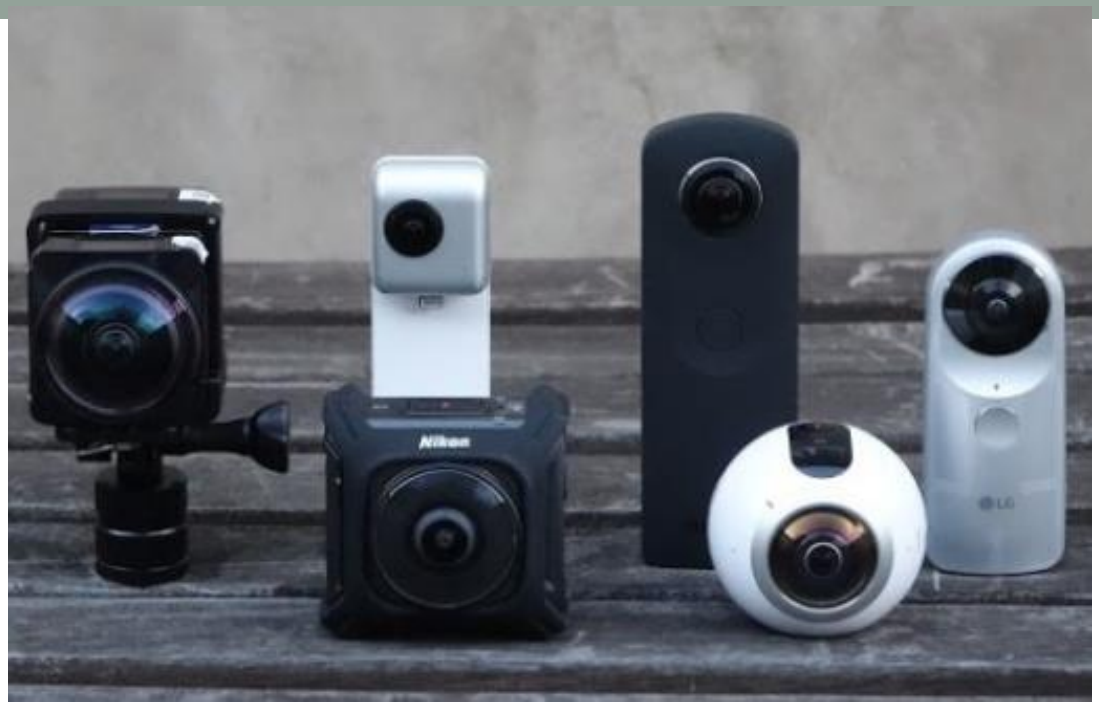
- Action cameras, sometimes called Adventure cameras, are great for outdoor filming, or otherwise rough conditions.
- They're often used for sports photography and videography.
- Weather and shockproof, these cameras are generally small and lightweight and the sensor is guarded with super durable glass
  - **Pros**: light-weight, compact, durable, view and shutter via smartphone, mountable almost everywhere, weather proof
  - **Cons**: small sensor, fixed focus, viewfinder not always available, little camera setting customization
- Recommendations: Any GoPro, Nikon Coolpix AW 130.

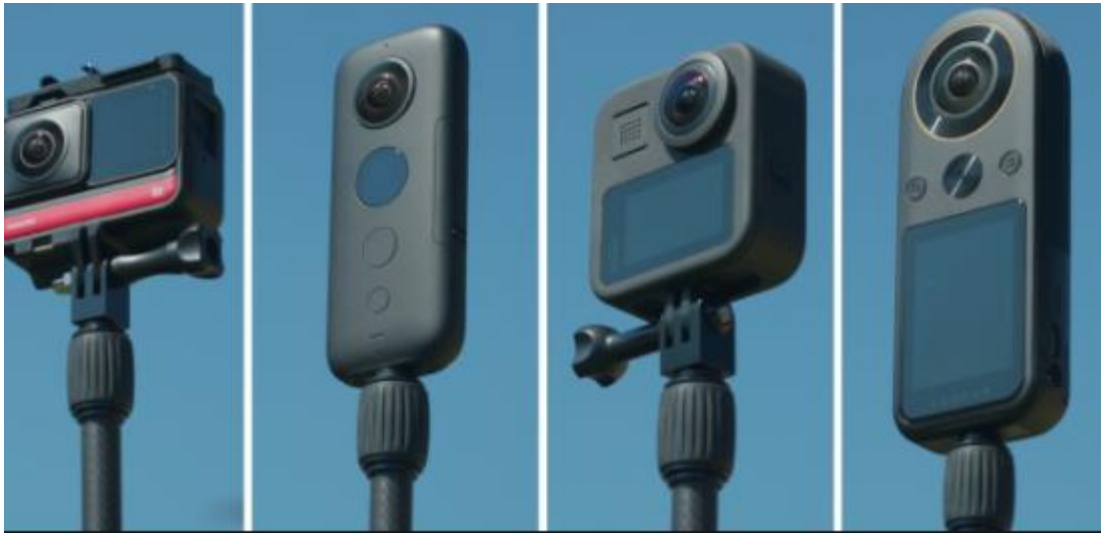



GoPro

360 Cameras

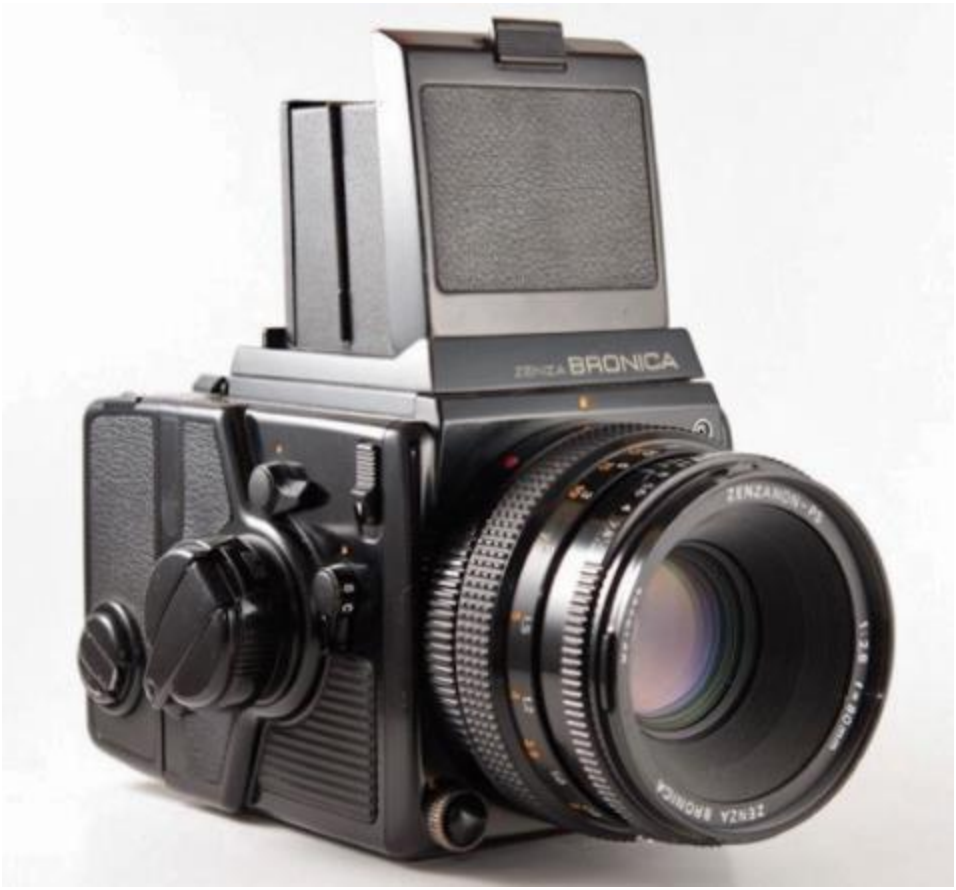
- Similar to action cameras, many 360-degree cameras are water resistant and mountable on a ton of surfaces.
- They can be put on drones, helmets, or cars.
- They have ability to capture really interesting footage.
- 360-degree footage using back-to-back lenses.
- Great for adventure photography and videography, perfect for reality style video.
  - **Pros:** Yields realistic 360 degree photos and videos, live streaming capability, small and lightweight, mountable on many surfaces
  - **Cons:** Digital viewing only, sensitive to shake, low resolution output, fixed focus
- Recommendations: Insta360 One X


Nikon
LG



Medium Format Cameras.

- Medium format is any camera format that makes use of the 120 film size or it uses a digital imaging sensor that matches that size.
- Medium format takes pictures that are just smaller than a large format size (102x127mm),
- but bigger than using 135mm or full-frame sensors.
  - **Pros:** Large sensor, greater dynamic range, image quality can't be beat
  - **Cons:** Big and bulky, extremely expensive
- Recommendations: Hasselblad H6D-100c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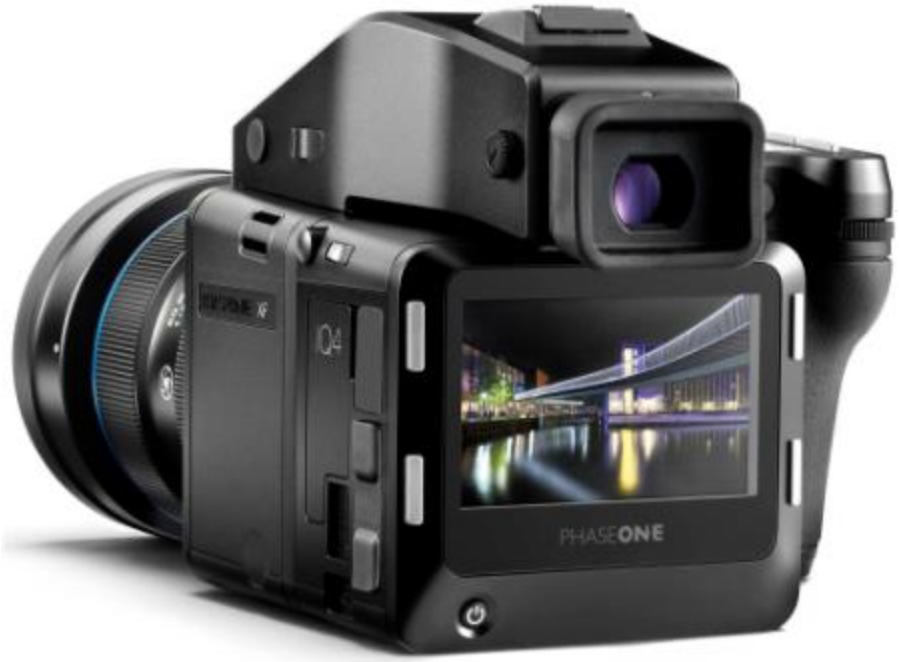
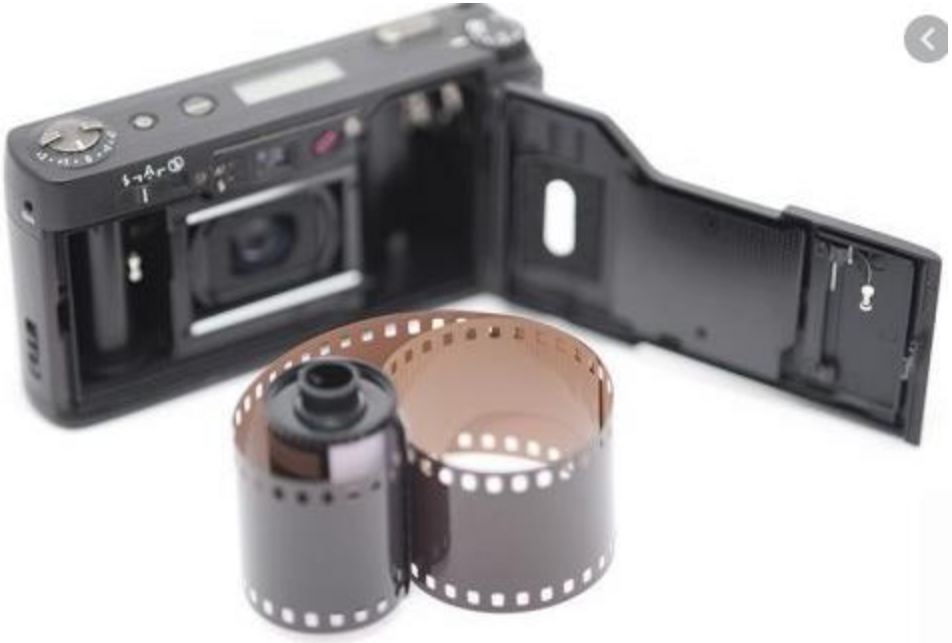
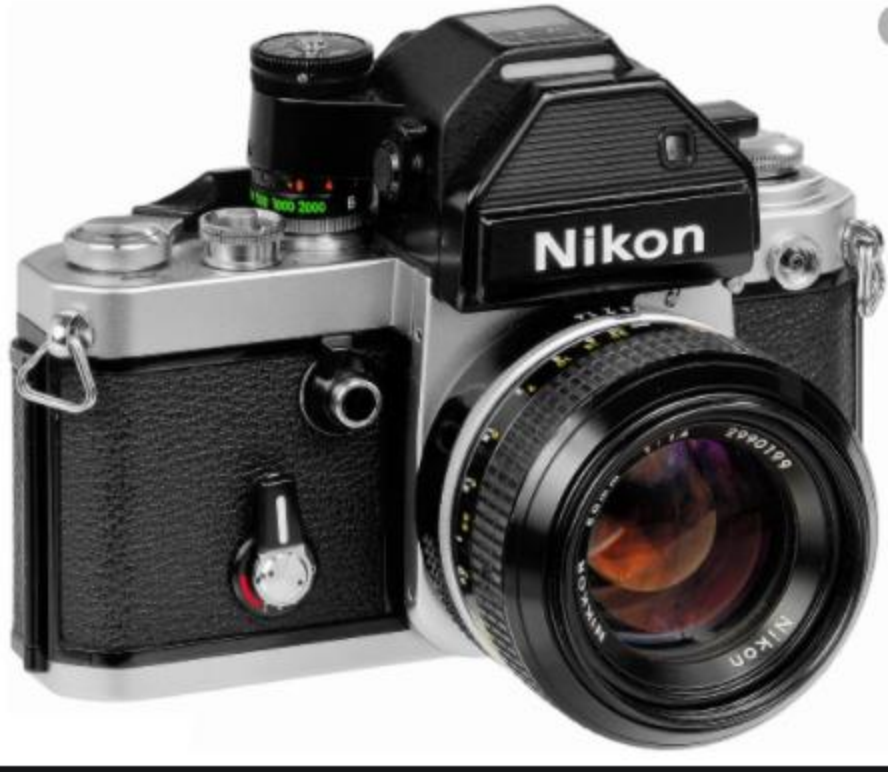

PHASEONE

Traditional Film Cameras

- Pros: Great image resolution, vintage look, inexpensive lenses
- Cons: Risk of exposure errors, expensive recurring developing and film costs, analog settings
- Recommendations: Canon AE-1 35mm Film Camera




Nikon

Parts of Camera

Lens

- The lens is one of the most vital parts of a camera. The light enters through the lens, and this is where the photo process begins.
- Lenses can be either fixed permanently to the body or interchangeable.
- They can also vary in focal length, aperture, and other details.

Viewfinder

- The viewfinder can be found on all DSLRs and some models of digital compacts.
- On DSLRs, it will be the main visual source for image-taking, but many of today's digital compacts have replaced the typical viewfinder with an LCD screen.

Cont..,

Body

- The body is the main portion of the camera, and bodies can be a number of different shapes and sizes.
- DSLRs tend to be larger bodied and a bit heavier, while there are other consumer cameras that are a conveniently smaller size and even able to fit into a pocket.

Image Sensor

- The image sensor converts the optical image to an electronic signal, which is then sent to your memory card.
- There are two main types of image sensors that are used in most digital cameras: CMOS and CCD.
- Both forms of the sensor accomplish the same task, but each has a different method of performance.

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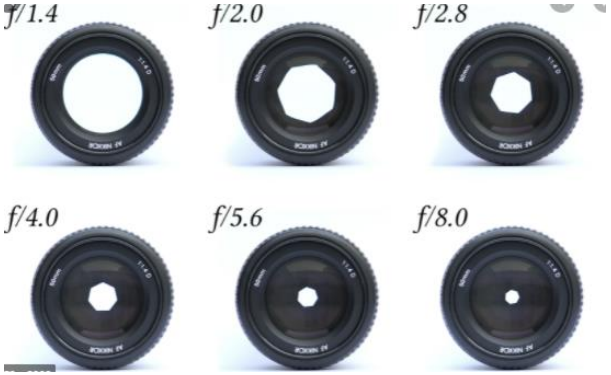

❑Shutter Release

- The shutter release button is the mechanism that “releases” the shutter and therefore enables the ability to capture the image. The length of time the shutter is left open or “exposed” is determined by the shutter speed.

❑Aperture

- The aperture affects the image’s exposure by changing the diameter of the lens opening, which controls the amount of light reaching the image sensor. Some digital compacts will have a fixed aperture lens, but most of today’s compact cameras have at least a small aperture range.
- This range will be expressed in f/stops.
- For DSLRs, the lens will vary on f/stop limits, but it is usually easily defined by reading the side of the lens. There will be a set of numbers stating the f/stop or f/stop range, ex: f/2.8 or f/3.5-5.6.

Cont..,

Memory Card

- The memory card stores all of the image information, and they range in size and speed capacity. The main types of memory cards available are CF and SD cards, and cameras vary on which type that they require.

- **8. LCD Screen**

- The LCD screen is found on the back of the body and can vary in size. On digital compact cameras, the LCD has typically begun to replace the viewfinder completely. On DSLRs, the LCD is mainly for viewing photos after shooting, but some cameras do have a “live mode” as well

Cont..,

- **Flash**

- The on-board flash will be available on all cameras except some professional grade DSLRs.
- It can sometimes be useful to provide a bit of extra light during dim, low light situations.

- **User Controls**

- The controls on each camera will vary depending on the model and type.
- Your basic digital compacts may only have auto settings that can be used for different environments, while a DSLR will have numerous controls for auto and manual shooting along with custom settings.


THE
END