# UNIT 15: STAGES OF PRODUCTION – 2

## UNIT STRUCTURE


15.1 Learning Objectives

15.2 Introduction

15.3 Production Stage Activities

15.4 Production Equipment

15.4.1 Equipment for EFP

15.4.2 Equipment for Studio Production

15.5 Lighting

15.6 Video Formats

15.7 Let us Sum up

15.8 Answers to Check Your Progress

15.9 Further Reading

15.10 Possible Questions


## 15.1 LEARNING OBJECTIVES

After going through this unit you will be able to:

- outline the activities that take place in the production phase.
- describe the different production equipments.
- explain the lighting technique for television production
- enumerate the different video formats

## 15.2 INTRODUCTION

In the last unit, we have discussed about pre-production. Pre-production is the stage in which all the background preparation towards the production stage is done. Now in this unit we will discuss about the production stage.

Production stage is basically the implementation stage. The actual shooting is done in this stage. Therefore, to know how production takes place, you will have to understand about the different equipment used for production, the concept of lighting, camera angles and movements, shot sizes etc.

Moreover, you will have to acquire some basic grounding about the different video formats.

In this unit, we will learn about equipment, lighting and some basic popular video formats. In the next unit, we will discuss about camera movements, angles and shot sizes.

## 15.3 PRODUCTION STAGE ACTIVITIES

Most viewers are unaware that the production phase is only the tip of the iceberg, the result of days, weeks, months or even years of planning. Production is the operational phase, when all the planning, writing, budgeting, worrying and dreaming that go into preproduction, reaps its rewards. Program elements are efficiently orchestrated and recorded on tape or broadcast live, making reality out of a producer's dream.

The production stage is the stage when the actual shooting takes place. During the production stage the actual product is created - sounds are captured and video is recorded. In this phase the final rehearsals and shooting takes place. Depending on the type of production, rehearsals may take place either minutes or days before the actual shooting. In case of live productions, rehearsals will need to be completely before recording starts. This includes early **walk-through rehearsals,** camera rehearsals, and one or more dress rehearsals. Otherwise scenes are rehearsed and recorded one scene at a time.



**Walk-through rehearsal:** Rehearsal in the early stage of production in which no camera is used

Production activities that you may be involved in include:

- following a script or outline to produce an audio production
- demonstrating care and maintenance of basic audio and video equipment
- operating basic audio equipment and recording in a variety of situations
- working in production teams
- following storyboards
- rehearsing
- setting up locations and blocking shots
- operating video cameras

- setting up lighting
- maintaining video equipment
- creating and modifying computer graphics



**CHECK YOUR PROGRESS**

Q.1. What activities are carried out during production of a television programme?

.....

.....

.....

Q.2. Write true or false:

a. Script writing is a part of production stage.....

b. Dress rehearsals are done during the production stage .....

c. The production stage comes after post-production .....



**ACTIVITY 15.1**

1. Get in touch with a local TV channel and visit them during the production of any programme on the sets. Make a note of all the activities and the equipment used.

## 15.4 PRODUCTION EQUIPMENT

### 15.4.1 EQUIPMENT FOR EFP

Depending on the kind of television programme, different equipment are used for production. Let us first discuss about the equipment required for EPF. It is important for you to know what kind of equipment and accessories you have to carry for an EPF so that your shooting is not hampered in any

way after you have reached the place of shooting. In single-camera Electronic Field Production (EFP), like news reporting some of the essential equipment required are as follows:

**Video Camera**



A professional video camera, also called a television camera is a high-end device for recording electronic moving images. Although the TV camera was originally developed for use in television studios, it is now commonly used for a variety of purposes including corporate and educational videos, music videos, and direct-to-video movies.

There are two types of professional video cameras: High end portable, recording cameras (essentially, high-end camcorders) used for ENG and EFP image acquisition, and studio cameras which lack the recording capability of a camcorder, and are often fixed on studio pedestals. Portable professional cameras are generally much larger than consumer cameras and are designed to be carried on the shoulder.

**Tripod**



The tripod is a three-legged device for supporting the camera. Mounted on top of the three legs is a tripod head onto which the camera is secured with a mounting screw. The tripod head is a device with a handle that allows the camera to pivot smoothly The adjustable legs allow for the tripod to be leveled on uneven surfaces, and the camera can be raised from 2 to 6 feet above ground to slightly above the eye level.

**Battery**




Most professional cameras are powered by a 13 or 14 volt battery. Batteries are used in camcorders when it is not possible to run a camera with electricity (with an AC power adaptor). Normally a camera battery can supply

continuous power for upto two hours. Lithium ion or Lithion batteries are most suitable for use with camcorders. Extreme temperatures can affect battery performance. Therefore one has to be careful not to expose the batteries to very high or very low temperature.

**Battery Charger**



A camera battery charger is a device used to put energy into a rechargeable battery by forcing an electric current through it. If the shooting is scheduled to a long duration, one has to be very cautious to carry a battery charger and an extra battery so that the shooting can continue even when one battery is exhausted.

**AC Power Adaptor**



An AC power adaptor is a device that converts the very high voltage electrical energy available in the conventional electric power mains to an appropriate voltage or current to run a video camera. Running the camera from the mains without using adaptor can be very hazardous and can cause severe damage to the camera due to the high voltage coming from the mains.

**Video Tape (Cassette)**



ideotape is a means of recording images and sound onto magnetic tape as opposed to movie film. Video tape/ cassettes are of different formats like- VHS, Betacam SP, Digital Betacam SP, DVCAM, DVCPRO, Hi8, Digital8, MiniDV etc. Presently, MiniDV and its high definition cousin, HDV, are the two most popular consumer tape-based formats. The formats use different encoding methods, but the same cassette type. Since 2001, when MicroMV was presented, no new tape-based formats have been introduced. The different formats have been discussed in detail in a subsequent section in this unit.

Tape is a linear method of storing information, and since nearly all video recordings made nowadays are digital, it is expected to gradually lose

importance as non-linear/random access methods of storing digital video data are becoming more common.

**Microphone**



A microphone, sometimes referred to as a mic or mike, is a device that converts sound into an electrical signal. There are different types of microphone, like dynamic microphones, condenser microphones etc. Now-a-days there are also a variety of sophisticated microphones like the lapel which is a small clip-on microphone that can be clipped onto the speaker's clothes. And then, there are cordless microphones so that one can move about easily with it. If there is audio to be recorded, it is very essential to carry along with the other equipment a good microphone, suitable for the purpose at hand.

**Batteries for Microphone (For Lapel Microphones)**




Condenser microphones normally work with additional battery power. These microphones normally have a battery enclosure where one or two pencil Lithium batteries can be fixed to make the microphone operational. Lapel microphones that are normally fixed on the lapel of a person are examples of such condenser microphones which work on additional battery power. One should always carry extra microphone batteries in case of emergencies.

**Headphones**



Headphones (also known as earphones, earbuds, stereophones, headsets), are a pair of small loudspeakers, with a way of holding them close to a user's ears and a means of connecting them to an audio-frequency signal source such as an audio amplifier, radio or CD player they can also be wireless/cordless. It is very necessary to wear a headphone when shooting in order to check any problem in audio.

**Lights And Necessary Power Cables**



Television is based on the medium of light; in fact, without light there could be no video. Just as sound must be skillfully controlled in audio production, light must be expertly controlled in television. Some of the common lighting instruments used in television production are: Sun guns, Fresnels, HMI (hydrargyrum medium arc-length iodide), cool fluorescent lights, soft lights, follow spots and gobos. Almost all incandescent lamps used in TV production are tungsten-halogen lamps (commonly called quartz lamps).

## 15.4.2 EQUIPMENT FOR STUDIO PRODUCTION

In the case of online studio-production, like a studio-based news bulletin or interview programme several equipment are used such as:

**Studio Cameras**



Studio cameras are very high quality cameras mounted on dollies, pedestals, jibs, or cranes on the studio floor and are used in various indoor and outdoor multi-camera productions. The basic difference between a studio camera and a camcorder or ENG camera is that a studio camera can function only as part of a camera chain, while the camcorder is self-contained and is capable of delivering the video signal to its recording unit without any other peripheral control equipment. Studio cameras are controlled by the production crew in the control room with the help of camera control units (CCUs). Depending on the genre of programming and the budget, the producer will deploy the required number of studio cameras.

**Camera Control Unit (CCU)**



A CCU can be defined as a remote control device used to set parameters for one or more television cameras in multi-camera productions. Each studio has its own CCU that is housed in the Production Control Room (PCR).

### Video Switcher



A video switcher, also called a vision mixer in common parlance, is a device that enables us to switch from one camera to another without actually stopping the camera(s) or the performers. With a series of input selectors that permits one or more selected inputs to be combined, manipulated, and set out on the programming line, a vision mixer is used for selection and proper sequencing of images by cameras and other input sources like titling, graphics machines, and VTRs.

### Teleprompter





A teleprompter is a device used to display text for performers on the studio floor. The presenter reading the news is not actually looking at us but at a teleprompter. The teleprompter has replaced handwritten cue cards that were once displayed by floor assistants.

### Talk-back Headphones



It is a pair of headphones that also comes with a microphone attached. Talkback headphones are used in recording studios to enable personnel in the control room to speak or give instructions to personnel in the recording area or booth with the help of an intercom system.

### Studio Monitors



Studio monitors are high quality television sets that display the video feed from the studio cameras, video players, titling and graphics machines, and the programme switcher. Studio monitors are very essential for the producer and the production crew for monitoring the programme output. They help the production crew see the shots, and select and record the desired ones.

### Graphics and Titling Machines



Apart from the video input selected from the studio cameras and the pre-recorded video materials, the producer requires some graphic inputs for giving final touches to the programme output. It may be some simple text keyed onto the video or complicated graphics. For this purpose, normally all studios have a titling and graphics machine.

### Video Tape Recorder (VTR) / player



VTRs are used for recording the final output onto the master tape in multi camera productions. All the connections to the recorder should be in proper order. Even a small goof up can render the whole recording useless. It is always advisable to have a standby recorder handy. During recordings, a production assistant is specially assigned for monitoring the recording.

### Audio Mixer



Audio mixers are instruments that control the volume of signals coming from various inputs like microphones, audio players etc. They equalize that is, manipulate the characteristics of input sound. They also route the mixed and equalized audio signals to specific outputs like recorders, speakers and headphones etc.

### Speakers (sound box)



The director and the production crew in the control room monitor the quality of audio with the help of programme speakers. It is for this purpose that speakers are provided in the control room. The final mixed output from the audio mixer is connected to the programme speakers through amplifiers. Whenever required, speakers are used to send feed audio into the studio for reference.



**CHECK YOUR PROGRESS**

Q.3. What are the functions of the following equipment:

a. Audio mixer

.....

.....

b. Video switcher

.....

.....

c. Talkback headphones

.....

.....

d. Teleprompter

.....

.....

e. Tripod

.....

.....



**ACTIVITY 15.1**

1. Visit a local television station and make a note of the different production equipment used in the station.
2. Intern at a local television station and learn how to operate the basic equipment of production.

## 15.5 LIGHTING

A good video demands good lighting. Lighting is an important component of composition and therefore audience's perception. Light and shade influence our judgments of shape, size and distance from the object. Lighting may enhance form, or suppress it. Lighting may draw attention to texture or hide

its existence. In fact, the overall effect of lighting within a scene depends on the direction of the light and on the degree of contrast between the bright and the dark areas.

**Good lighting serves the following purposes:**

- Facilitates camera performance to get good picture quality.
- Does not interfere with other aspects of production like position of other lights, placement of microphones, scenery, property etc.
- Enhances the aesthetic quality of the object being shot.
- Produces an impression of three-dimensional solidity.
- Guide the attention of the audience and not call attention to itself.

**Factors affecting lighting**

Irrespective of whether one uses natural light (sun) or artificial lights, the following factors affect the picture:

1. **Intensity:** It refers to the amount or strength of light on a given area. This in turn depends on the lighting instruments and its distance from the object.
2. **Hardness or softness of light:** Hard lights throw harsh shadows but bring out all the details. Soft lights on the other hand throw soft shadows and show lesser details.
3. **Direction of light:** The height and the angle at which the light is placed produces different results. Depending on the context, a subject is frontally lit, side lit, back lit, top lit or bottom lit or with a combination of these. For example, a backlight only highlights the edges of the object. An object lit from below produces a sinister effect. Light hitting an object from the side highlights contours.
4. **Colour Temperature:** Yet another important factor to consider is the colour temperature. Colour temperature is a measure of the 'warmth' or 'coldness' of the light. Each kind of light source produces light rich in a certain spectrum — red, green, blue, yellow etc. For example, a tungsten lamp produces light which is orangish-red, a fluorescent lamp produces a bluish white light. Sometimes it shows a greenish white light. Colour quality is rated in terms of colour temperature and is measured in Kelvin (K). Light with a colour

temperature of less than 3500K are usually described as warm and those with a colour temperature over 5000K are considered cool while those with a colour temperature over 5000K are said to have a cold appearance. In other words higher the colour temperature, cooler is the source light. Since the camera cannot differentiate between different colour temperatures, one has to perform the **white balance**. This becomes necessary because the 'colour' of light varies at different times of the day and when lighting changes from natural to artificial.

**Three-point lighting:**

One of the commonest ways of lighting up subjects is by using the three-point lighting technique. It is the most basic lighting technique that produces an appreciable picture. This technique was borrowed from photography and has stayed over the years.

A three-point lighting set-up comprises a **Key** light, a **Fill** light and a **Back** light.

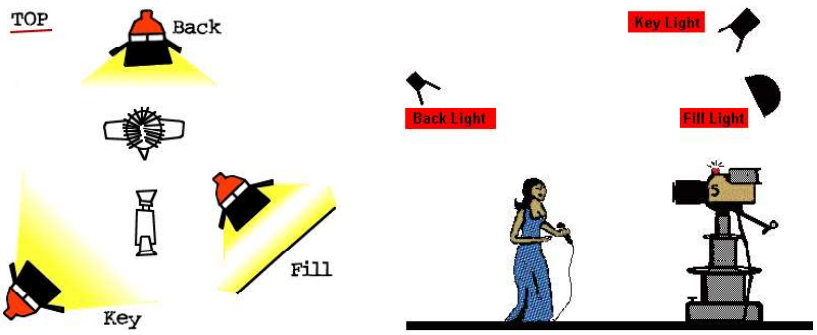



**Fig**: The 3-point lighting system

**Key light**: Defines the shadows of an object. It is placed at 45 degrees to the object. It produces clear shadows. The key light is placed at an angle of between 30- and 45-degrees from either the left or the right of the camera.

**Fill light:** This is a soft light that reduces the shadows to a large extent. It is placed opposite to the key light and true to its name, it fills in areas that cannot be lit by the key light. The purpose of the fill light is to partially (but not entirely) fill in the shadows created by the horizontal and vertical angles of the key light. Ideally, the fill light should be about 90 degrees away from the key light. Generally, the fill is placed just above the camera, as shown

above, which means it ends up being slightly lower than the key. In this position it can easily do what it's intended to do: partially fill in the shadows created by the key light.

**Back light:** The function of the back light is to separate the subject from the background by creating a subtle rim of light around the subject. This highlights the hair and the shoulders of the subject. It serves to separate the object from the background. The back light, is therefore sometimes called a hair light, and is placed directly behind the subject in relation to the close-up camera. Although the elevation of the back light is often dictated by conditions, a 45 degree angle is most desirable.By using only back lights with no front lighting a silhouette effect can be created. This can be used for dramatic effects or to hide someone's identity.It is not always possible to use 3-point lighting particularly when you are shooting groups of people. One will need to improvise. The best way perhaps is to create a natural and appropriate look to the scene.



**CHECK YOUR PROGRESS**

Q.4. Explain the 3 point lighting technique.

.....

.....

Q.5. Name the different factors that determine the effect of lighting on the picture.

.....

.....

Q.6. Define the following:

a. Key light

.....

.....

b. Fill light

.....

.....

b. Back Light

.....

.....

## 15.6 VIDEO FORMATS

There are four levels of quality in videotape formats: **consumer, prosumer, industrial and broadcast professional**. Each format has its place in the videotape marketplace. The production and delivery requirement determines which videotape format we use. Naturally, a project for home use will have completely different requirement than a project going out for a network broadcast.

**Popular video formats**:

| Name | System | Tape Width | Purpose |
|---|---|---|---|
| **VHS/S-VHS (Video Home System / Super-Video Home System)** | Analog | ½ inch | Mainly for home/ consumer use |
| **¾ inch U-matic,** | Analog | ¾ inch | For industrial broadcast |
| **¾ inch U-matic SP** | | | purpose. |
| **Betacam, Betacam SP** | Analog | ½ inch | For industrial broadcast purpose. |
| **Betamax** | Analog | ½ inch | Used before/ along with VHS, now phased out. |
| **Video 8, Hi8** | Analog | 5/16inch (8mm) | For amateur use. |
| **Mini DV** | Digital | ¼ inch | For both Prosumer (professional/consumer) and amateur use, mostly used in educational institutions for training purposes and occasionally used for broadcast purpose. |
| **DVCPro ( D7)** | Digital | ¼ inch | Broadcast use. |
| **DVCAM** | Digital | ¼ inch | Broadcast use. |
| **HDV (High Definition Video)** | Digital | 1920 x 1080 pixels | The latest format for both prosumer and broadcast use. |



**CHECK YOUR PROGRESS**

Q.7. What is the size of a DVCAM tape?

.....

Q.8. Name two tape formats used for industrial broadcast purpose?

.....

Q.9. Which tape is used in educational institutions for training purpose?

.....

## 15. 7 LET US SUM UP

1. The production stage is the stage when the actual shooting takes place. During the production stage the actual product is created - sounds are captured and video is recorded.
2. Depending on the kind of television programme, different equipment are used for production. In single-camera Electronic Field Production (EFP), like news reporting some of the essential equipment required to be carried are Video Camera, Tripod, Battery, Battery Charger, AC Power Adaptor, Video Tape (Cassette), Microphone, Batteries for Microphone (For Lapel Microphones), Headphones, Lights and Necessary Power Cables.
3. In the case of online studio-production, like a studio-based news bulletin or interview programme several equipment are used such as Studio Cameras, Camera Control Unit (CCU), Video Switcher, Teleprompter, Talk-back Headphones, Studio Monitors, Graphics and Titling Machines, Video Tape Recorder (VTR) / player, Audio Mixer and Speakers (sound box).
4. A good video demands good lighting. Lighting is an important component of composition and therefore audience's perception.
5. Irrespective of whether one uses natural light (sun) or artificial lights, the following factors affect the picture — Intensity of the light, Hardness or softness of light, Direction of light and Colour Temperature.

6. One of the commonest ways of lighting up subjects is by using the three-point lighting technique. It is the most basic lighting technique that produces an appreciable picture.

7. A three-point lighting set-up comprises a **Key** light, a **Fill** light and a **Back** light.

8. There are four levels of quality in videotape formats: **consumer, prosumer, industrial and broadcast professional**. Each format has its place in the videotape marketplace.

## 15. 8 ANSWERS TO CHECK YOUR PROGRESS

**Ans to Q. No. 1 :**

A range of activities are carried out during the production phase. They can include the following:

- following a script or outline to produce an audio production
- demonstrating care and maintenance of basic audio and video equipment
- operating basic audio equipment and recording in a variety of situations
- working in production teams
- following storyboards
- rehearsing
- setting up locations and blocking shots
- operating video cameras
- setting up lighting
- maintaining video equipment
- creating and modifying computer graphics

**Ans to Q. No. 2 :** **a)** False

**b)** True

**c)** False

**Ans to Q. No. 3 :**

**a)** Audio mixers are instruments that control the volume of signals coming from various inputs like microphones, audio players etc. They equalize that is, manipulate the characteristics of input sound.

They also route the mixed and equalized audio signals to specific outputs like recorders, speakers and headphones etc.

**b)** A video switcher is a device that enables us to switch from one camera to another without actually stopping the cameras or the performers. With a series of input selectors that permits one or more selected inputs to be combined, manipulated, and set out on the programming line, a vision mixer is used for selection and proper sequencing of images by cameras and other input sources like titling, graphics machines etc.

**c)** Talkback headphones are used in recording studios to enable personnel in the control room to speak or give instructions to personnel in the recording area or booth with the help of an intercom system.

**d)** A teleprompter is a device used to display text for performers on the studio floor. The presenter reading the news is not actually looking at us but at a teleprompter. The teleprompter has replaced handwritten cue cards that were once displayed by floor assistants.

**e)** The tripod is a three-legged device for supporting the camera. Mounted on top of the three legs is a tripod head onto which the camera is secured with a mounting screw.

**Ans to Q. No. 4 :**

One of the commonest ways of lighting up subjects is by using the three-point lighting technique. It is the most basic lighting technique that produces an appreciable picture. This technique was borrowed from photography and has stayed over the years.

A three-point lighting set-up comprises a **Key** light, a **Fill** light and a **Back** light. The key light is placed at 45 degrees to the object. It produces clear shadows and defines the shadows of an object. The fill light is placed opposite to the key light and true to its name, it fills in areas that cannot be lit by the key light. Ideally, the fill light should be about 90 degrees away from the key light. Generally, the fill is placed just above the camera, as shown above, which means

it ends up being slightly lower than the key. The function of the back light is to separate the subject from the background by creating a subtle rim of light around the subject. It is placed directly behind the subject in relation to the close-up camera. Although the elevation of the back light is often dictated by conditions, a 45 degree angle is most desirable.

**Ans to Q. No. 5 :** The factors that influence the effect of lighting are:

a. Intensity of the light

b. Hardness or softness of light

c. Direction of light

d. Colour Temperature

**Ans to Q. No. 6 : a) Key light**: It is the light which defines the shadows of an object. It is placed at 45 degrees to the object. It produces clear shadows. The key light is placed at an angle of between 30- and 45-degrees from either the left or the right of the camera.

**b) Fill light:** This is a soft light that reduces the shadows to a large extent. It is placed opposite to the key light and true to its name, it fills in reas that cannot be lit by the key light. The purpose of the fill light is to partially (but not entirely) fill in the shadows created by the horizontal and vertical angles of the key light.

**c) Back light:** It is the light which separates the subject from the background by creating a subtle rim of light around the subject. This highlights the hair and the shoulders of the subject. The back light, is therefore sometimes called a hair light, and is placed directly behind the subject in relation to the close-up camera.

**Ans to Q. No. 7 :** The size of a DVCAM tape is ¼ inch.

**Ans to Q. No. 8 :** Betacam and DVCPro.

**Ans to Q. No. 9 :** Mini-DV



## 15. 9 FURTHER READING


1. Belavadi, Vasuki (2007) Video Production. Oxford University Press.
2. Zettl, Herbert (2015) Television Production Handbook. USA : Cengage Learning
3. Donald, Ralph, Maynard, Riley, Spann, Thomas (2008) Fundamentals of Television Production. Pearson/Allyn and Bacon.




## 15. 9 POSSIBLE QUESTIONS

Q.1. If recce is the heart of a production, shooting is its soul. Elucidate.

Q.2. Explain the 3 point lighting system? Why is this system the most ideal system for studio lighting?

Q.3. What is the difference between a professional TV camera and a studio camera?

Q.4. Why and how is equipment for EFP different from studio production equipment?

Q.5. What are the different video recording formats?