AUDIO VISUAL EDUCATION

Module V Audio Aids

Unit 2 Principles of Audio Equipment.

Instructional Objectives:

1. Name the five factors which influence the quality of sound production.

2. State the range of hearing capacity for normal human ear.

3. Differentiate between monaural and stereo systems.

4. Describe the function of tone control in a tape recorder.

5. State what should be the correct height of placing speakers.

6. Select the type of microphones suited for picking up sound from different speech directions.

7. Classify microphones based on the technical classification.

8. State the three essential characteristics to be considered while replacing microphones.

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Module V Audio Aids

Unit 2 Principles of Audio Equipment

Introduction:

Any sound when reproduced must resemble the original performance, or at least closely resembles the original performance. The quality of the reproduction is depended upon the quality and type of the equipment used and the skill of the operator in using the equipment. The factors affecting sound quality are:

1. Quality of original sound.
2. Conditions of recording and playback
3. Capability of the recording medium to record full frequency range.
4. Capability of recording system to reproduce all frequencies.
5. Distortion free recording and play back and ability of the operator in handling the equipment.

Although hearing capacity varies widely with individuals, the normal human ear can respond to and identify tones as low as 30 and as high as 15000 cycles per sec. Speeches vary between 1000 to 3000 cycles per sec. Though most of the yesterdays sound equipment used to be only monaural now a days we get good quality Indian made stereo sound equipment. By monaural we mean onechannel-one speaker system, and stereo system have generally two channel-tracks playing at the same time.

CONTROLS:-

Controls for sound reproduction in tape recorders and record players are:-

1. On/Off switch.
2. Volume Control
3. Tone Control
4. Speed Selector
5. Stop Mode
6. Play mode
7. Record mode
8. Fast forward
9. Rewind control
10. Pause mode

Amplifier on/off switch may be separate or combined with volume or tone control. Volume control switch for stereo equipment may be separate for each channel or have separate balancing controls to adjust volume between left and right speaker channels are provided. Tone controls usually serve to eliminate high frequencies. Some equipment are provided with separate controls for bass and treble. Most equipment are provided with different speeds, and the speed selector sets the speed for recording and replaying. Higher speeds are better for high fidelity. Cassette tape recorders have only one speed, while real to reel and most of the record players have more than one speed. You may now go and indentify these items in a tape recorder and record player.

Speaker Placement:-

Most cheaper equipment have built in speakers with the recorders. For better quality equipment we have separate speakers. Their placement is very important, especially if the system is stereo. This depends on a number of factors, but some general guidelines and suggestion are given below:-

1. The speakers must be at the ear level of listeners.
2. Set the speakers off the centre in a long room and direct it diagonally across the listen-ing area.
3. If a speaker is enclosed inside a record player or tape recorder, the same rule will still apply.
4. If two speakers are to be placed, move them apart until sound seems to come from between them.

MICROPHONES:-

There are different types of microphones.

1. Unidirectional microphones:-

As the name indicates, the microphone picks up sound from one direction, and therefore is used for one person.

2. Bi-directional microphones:-

It picks up sounds from both front and back sides. They are suitable for recording sound from different sides- the audience and the speaker, or two or more persons.

3. Omni-directional microphones:

Are sensitive to sounds from all sides or directions around the horizontal plane of the unit. These are useful for round table discussions.

4. Lavalier and Lapel microphones:

Are desired to be worn by the speaker, permitting him more freedom of movement than he would have with a fixed mike.

5. Wireless Microphones:

Are miniature FM transmitters, they provide maximum freedom of movement since no cords are required. These microphones transmits sound to any F.M. receiver tuned to the frequency and can be taped or fed through public address system.

PLACEMENT OF MICROPHONES:

No microphone should be placed very close to the Mouth. If you do so, it will result in unnatural voice. The best thing to do is to test and retest to determine most suitable position with reference to the performance. When you have more than one person to record, you must be prepared to adjust and accommodate individual voice and behaviour of speakers. For stereo recording two types of microphone arrangements may be made. There are few microphones where single unit contains both left and right channel inputs. In the second one, the two microphones are separate units, each feeding one channel in the amplifier. In either case trial and re-trial to achieve proper location of the microphone unit(s) are essential for good balance. Occassionally an extension cord can be used for the tape recorder, but cords more than 2 M will not be suitable for the results may not be satisfactory, if special provision is not made. For this you must have low impedance equipment, microphones, transformers and pre-amplifier mixers. You should not mix several mikes of different impedance and non-matching recorders.

Technical classification of microphones are the dynamic, the magnetic, the ceramic and condenser type.

A microphone has to be of good quality, i.e. distortion free and has a smooth and level frequency response. Also, it has to have correct impedance, i.e., matching resistance value and output level to match the recorder's input. If your choice is incorrect, it is not that your work or recording will be of poor quality, but it will be incapable of doing its job at all. Ceramic mikes are usually of high impedance. Dynamic mikes are available in low, middle or high impedance. Magnetic mikes are only with high impedance. DO NOT USE LONG CORDS with DYNAMIC MIKES AT ANY COST, as it makes quality "woolly".

AUDIO VISUAL EDUCATION

CRITERION TEST

MODULE V Audio Aids Time : Mts.

Unit 2 Principles of Audio Equipment.

For questions 2 to 8 circle the alphabet of correct answer and for the rest write correct answer in the space provided.

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1. Name the six factors, which influences the quality of sound production.

   a.

   b.

   c.

   d.

   e.

   f.

2. Hearing capacity of human ear to respond fall in the range of

   ____ a. 10-30 cycles per second.

   ____ b. 1000-3000 cycles per second.

   ____ c. 500-800 cycles per second.

   ____ d. 30-1500 cycles per second.

3. A monaural tape recorder must have

   ____ a. two channels and one speaker.

   ____ b. two channels and two speakers.

   ____ c. one channel and one speaker.

   ____ d. one channels and two speakers.

4. The function of tone control is to:

   ____ a. control the volume

   ____ b. balance the volume control in a stereo system.

   ____ c. eliminate low frequencies.

   ____ d. eliminate high frequencies.

5. If you are asked to position the speakers of an audio system, which one of the following will be your choice ?

____ a. knee level

____ b. ear level

____ c. below the ear level

____ d. 300 mm above the ear level.

6. Tone control is operated during:

____ a. recording only

____ b. playing only.

____ c. playing and recording.

____ d. stereophonic recording only.

7. You are required to record a conversation between two individuals sitting opposite, which one of the following microphones will be your choice ?

____ a. bi-directional microphone

____ b. uni-directional microphone

____ c. one lavalier microphone

____ d. one lapel microphone

8. A group of persons are sitting around and discussing. If you want to record audio of this actively, what will be your type of microphone ?

____ a. bi-directional microphone

____ b. lapel microphone

____ c. omni-directional microphone

____ d. uni-directional microphone

9. Name the four types of microphone based on their technical classifications.

a.

b.

c.

d.

10. You are to replace a microphone for one of your tape recorders and it has to be of good quality and correctly matched. Name the characteristics you will look for while buying the replacement.

a.

b.

c.

AUDIO VISUAL EDUCATION

KEY TO
CRITERION TEST

Module V — AUDIO AIDS

Unit 2 — Principles of audio equipment

1. Name the five factors, which influences the quality of sound production.
   a. Quality of original sound.
   b. Condition of recording and playback.
   c. Capability of medium to record full frequency range.
   d. Capability of the system to reproduce all frequencies.
   e. Distortion free recording and playback.
   f. Ability to handle the equipment.

2. Hearing capacity of human ear to respond fall in the range of
   ____ a. 10-30 cycles per second.
   ____ b. 1000-3000 cycles per second.
   ____ c. 500-800 cycles per second.
   __**__ d. 30-1500 cycles per second.

3. A monaural tape recorder must have
   ____ a. two channels and one speaker
   ____ b. two channels and two speakers
   __**__ c. one channel and one speaker.
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   ____ a. control the volume.
   ____ b. balance the volume control in a stereo system.
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   __**__ d. eliminate high frequencies.

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   ____ a. knee level.
   __**__ b. ear level.
   ____ c. below the year level
   ____ d. 300 mm above the ear level.

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** a. bi-directional microphone

____ b. uni-directional microphone

____ c. one lavalier microphone.

____ d. one lapel microphone.

8. A group of persons are sitting around and discussing. If you want to record audio of this group actively, what will be your type of microphone ?

____ a. bi-directional microphone

____ b. lapel microphone

** c. omni-directional microphone

____ d. uni-directional microphone.

9. Name the four types of microphone based on their technical classifications.

a. dynamic

b. magnetic

c. ceramic

d. condenser

10. You are to replace a microphone for one of your tape recorders and it has to be of good quality and correctly matched. Name the characteristics you will look for while buying the replacement.

a. free from distortion

b. matching impedance

c. matching both output of mike and input of recorder.