UNIT 12: SOUND RECORDING

UNIT STRUCTURE

12.1 Learning Objectives
12.2 Introduction
12.3 Sound Recording for News Bulletin
12.4 Radio Equipment (Microphones etc)
12.5 Let us Sum up
12.6 Answers to check your progress
12.7 Further reading
12.8 Possible Questions

12.1 LEARNING OBJECTIVES

In this unit, you will learn:

- how to record sound for radio reporting.
- about the different types of radio equipment used in broadcasting stations

12.2 INTRODUCTION

In the previous unit, we have discussed radio interview and its types, approaches, how to prepare for a radio interview and also the rules for conducting radio interviews.

Now, another very important topic to know along with radio interview is sound recording. Sound recording is an electrical or mechanical inscription and re-creation of sound waves, such as spoken voice, singing, instrumental music, or sound effects. In this unit you will be able to learn about the basic techniques of sound recording, introduction to different kinds of Radio equipment (microphones) etc and their use.

So, let us begin this unit with the first section – sound recording for news bulletin.

12.3 SOUND RECORDING FOR NEWS BULLETIN

Getting a good quality recording is the most important and sometimes the most difficult task of a radio reporter. Radio reporters have to be Jacks and Jills of all trades, but just because you are good at writing imaginative radio pieces that doesn't mean that you have an aptitude for operating electronic equipment. Often the opposite is true.

When you are reporting news for the radio, you are doing a lot of jobs. When you are busy concentrating on what your interview subject is saying, you are paying attention to many other things simultaneously and making eye contact and thinking about your next question - all at the same time. You may not notice, for example, that the person in the next room has turned the television on and the sound is bleeding through the wall and onto your tape. Or that your tape recorder is occasionally distorting the sound because your record level is set too high. But if you don't get a high quality recording the amount of work you have to do later will increase exponentially.

Getting a good field recording makes editing easy. You want to make a recording with the smallest amount of extraneous noise possible.

You may want to record an ambient sound if it has some bearing on the story but try to record it separately and mix it into the background later. That way you avoid the sound of "butt cuts" in which the ambient noise suddenly jumps into being.

Here are **some suggestions** to help you.

(i) Take charge of the environment!

Often you will end up interviewing people in their offices because that is where people spend a lot of their time. Offices are not great places to do interviews. With many hard, reflective surfaces, they are often echoed or just generally noisier than rooms with soft furnishings which dampen sound. They usually have noisy equipment like computers running besides there's often traffic outside and officemates who decide to have a loud conversation in the hallway outside when you're in the middle of an interview.

It is a bigger problem when the recording takes place outdoors. Though some ambient sound is necessary, excessive 'noise' coming from traffic, people shouting etc, may make the recording very difficult. So the best idea is to use a location where recording is within the control of the reporter.

ii) Kill the noise

Certain people, like scientists and academics, may not be happy or able to turn off their computers, but you should assure them that you wouldn't want to waste their time by making a recording which may be of sub-standard quality. So, if it is not possible to turn off the equipment, you should move as far away from it as possible and sit with your back to the source of the sound so that your microphone points away from it.

Tell the people in adjacent rooms what you are doing and asking them if they can possibly avoid making noise for the duration of your interview.

iii) Batteries, power cords and headphones

However, watch out for a rare problem when using air conditioners. Electrical circuits, such as those in old houses, sometimes generate an electrical hum which may show up in the background of your recording if you use the ac power for your tape recorder. Listening to the interview through your headphones will tell you if you have this rare phenomenon. You can prevent it by using battery power.

You should always use headphones during the interview. It will allow you to head off all kinds of mistakes in the recording. It also establishes you as a professional.

Always clean and maintain your equipment. Always carry a head-cleaner for the tape recorder.

iv) Get comfortable

If there is a table in the room, interviewing across the corner of the table is perfect because it gives you a place to rest your arm on (the arm will get tired if you are interviewing for 45 mins or an hour, which is common). Place your tape recorder where you can look at it to check levels without taking your eyes too far away from the person you are interviewing. If that is

not possible, explain to the person that you may occasionally have to look away to check that things are being recorded properly, but that he or she should keep talking in that situation.

v) Outdoors

Outdoor interviews can become some of the most evocative radio programmesbecause they give the listener a sense of place. Instead of trying to eliminate all extraneous sound you deliberately use the sound of the local ambience to enhance the meaning of the interview.

If you do an interview outdoors, make sure that it is for a good reason. If you are interviewing a doctor about breast cancer, don't do it in the park across from her office, because there is no reason for her to be there for the interview with all the traffic passing by. If you are interviewing a gardener about air pollution, then it is a perfect place to be in.

When you are outdoors in a very noisy environment, like street fairs or crowds, you need to change your recording technique. Turn your recording levels down and mic very closely (within a few inches). By doing this you continue to highlight your interview but you put the ambience further into the background. It is still present, but is likely to intrude less on the interview in the foreground.



Mic: Microphone

When you are outside, deliberately working with environmental sound, it is even more important to collect ambient tracks. Record a couple of minutes in the place where you do the interview and if there are specific sources of noise, such as birds or musicians or machines, record those separately and from a variety of distances. This gives you the opportunity to create a full scale ambient sound bed to run beneath your own tracks in the final mixed piece.

Basic Recording Techniques : Some of the basic recording techniques are discussed below.

i) Before you start recording check your batteries and check that the mic lead (and headphone lead, where applicable) are connected properly. Put the machine into **record mode** and do a brief test recording. Check your recording levels, and playback.

ii) Microphones are very sensitive and need to be handled carefully. Hold the mic firmly, but not too tightly. To avoid moving the mic lead, take a small loop of it in your 'mic' hand, being careful that it is not actually touching the body of the mic.

iii) Put the machine into record mode. If you have a speaker on the machine, make sure the playback volume is right down. Otherwise you may get feedback or very strange echoes. Make sure that the pause button is off before you begin recording.

iv) If you are recording someone talking, hold the mic about six inches or 15 cm from his/her mouth. (it is usually a good idea to hold it down from the chin - not right in front of the face). Ask them to say their names and how they want to be described etc. It is useful (a) to identify the tape and make sure you have that information and (b) to quickly check the recording levels that will be best for them.

v) If you're recording music, sound effects etc., position yourself so that you get a good, balanced sound. Adjust your recording level so that you get a good, strong level on the meter but make sure that it is not too loud.

vi) Once you've finished a recording, always rewind a few seconds of the tape and play it back just to check (a) if there's something on the tape and (b) that the recording is of good quality. Never record sound from the public address system speakers.

Troubleshooting

When you're just starting out, it's important to remember that even the best reporters have made basic mistakes using portable recorders. Don't worry too much if your early recordings are full of mistakes. It's all part of learning how to use the equipment. To help you avoid the most common mistakes, here's your very own guide to trouble shooting.

Problem : You try to record but nothing happens

Check whether:

- The machine is switched on (if applicable)

- The batteries are in and charged, and the machine seems to be working
- The microphone is switched on (if applicable) and properly connected
- There's a tape/cassette in the machine and it is put correctly
- The tape is running cleanly past the heads

Problem: You listen back to your recording and there's nothing there

Check:

- The pause button isn't on
- The tape/cassette is in correctly and running past the heads
- The heads are clean
- The microphone is switched on and the lead is connected properly
- The batteries are in and charged

Problem : The recording is very muffled /faint /distorted

Check whether:

- The heads are clean
- The batteries are charged
- The recording level isn't too low or too high
- The speaker on your machine wasn't playing back and causing feedback
- It's not too windy if you're recording outside.

Problem : There's a humming or buzzing noise on the recording

Check:

- You're not recording near electric apparatus (e.g. fluorescent lights, computers, fridges, overhead high voltage power lines)
- Your recorder isn't plugged into the mains power – it may get interference

Problem : Distracting background noise

Check:

- You're not recording near ticking clocks, barking dogs, screaming children or windows overlooking busy streets etc.
- Your recording levels. If you're recording at a rock concert, near a busy road etc., set your recording levels very low (so the background

noise is just registering), ask your guest to speak firmly, and hold the mic very close to their mouth - sometimes literally just below their lips!

Problem : You're in a large conference room/busy street with a lot of noisy activities..

Check:

- If there's not a quiet place where you can record, then use your body as a 'natural shield' - turn your back to the noise and use close mic work. If you're in a room stand in a corner with your back turned to the main source of noise.

These are just a few of the most basic and most common problems you're likely to have. If you can't correct a problem, don't just hope it'll go away. Ask someone more experienced than yourself. It may be that something is actually wrong with your machine. Do try to correct the obvious and basic faults on your equipment. Don't try to correct any problems with the electronics, wiring or the motor unless you're trained in those skills. You could cause more damage to the equipment than is already there!

CHECK YOUR PROGRESS



Q.1. Outdoor recording can be very challenging. Discuss the measures that need to be taken when reporting from an outdoor location.

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Q.2. Why is it necessary to wear headphones always while recording for radio?

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12.4 RADIO EQUIPMENT (MICROPHONES ETC.)

As each studio will differ in some way it is important to familiarize yourself with the basic studio equipment. You will then be able to apply this knowledge to any studio you use.

Now let us turn to the equipment:

- Central to the radio studio is the **mixing desk**. All other equipment in the studio is connected to it. There are many designs but things to look out for are the **faders** - which control how much volume comes out of the desk. The amount of faders on the desk varies - it usually depends on how much equipment you have. Ideally each piece should have its own fader. Whether there are four or forty faders they all serve the same function. So once you've learnt how to use one you should be able to use them all!
- Each fader should have a **gain control**; this affects how much volume goes into each fader.
- Below the gain there may be a **pre-fade switch**. This switches the output of the fader to a set of meters, enabling you to check the levels before the fader is open - hence it is called pre-fade switch.
- Levels are measured by a set of **meters.** There are two kinds of meters such as **vu meters** - which have a needle peaking at 0 and occasionally flicking into the +1 scale, or **ppm meters** (peak programme meters) - which respond to signal peaks and usually have seven markings from one to seven. Normal programme output should peak the needle between 5 & 6 for speech and between 4 & 5 for music. These meters enable you to check the correct level going into the desk. In more sophisticated studios there are also meters which tell you how much level is going out of the desk to the transmitter. Don't panic if your desk has only one set of meters; they will be sufficient.
- To enable you to listen to the output of the desk there will be a socket for **headphones** and on the desk a **volume control** for these. Some desks have a split switch for the headphones which enables you to hear a pre-fade source and the output of the desk at the same time.

• You can also connect a pair of **speakers** (or **monitors** to give them their technical term) from the output of the desk. These need to be turned down, either by hand or by a special cutout switch connected to the microphone, so that you don't get feedback (the output of the microphone coming out of the speakers back into the microphone, ending up as a high pitched whining sound.)

The desk will also have a series of inputs for your external pieces of equipment. The number of equipment varies but the most basic of these the studio has are:

• One or more **microphones**: The main one will be used by the presenter, who will usually also be operating the mixing desk. It needs to be positioned in a way so that you can comfortably speak into it, without getting in the way of the mixing desk or any other equipment. One or more of the other microphones may also be connected to the mixing desk. These will be used by other people taking part in your programme (e.g. other reporters/ presenters or guests). These mics also need to be positioned in such a way that they can be used whilst the guests keep sitting comfortably.

• A **record deck/cd player** and **tape recorder**: These will often be very similar to the equipment used at home. In the studio, the record deck and cd are used to play music into the mixing desk (and out to the transmitter and the listener). Very occasionally, they may also be used for playing sound effects (e.g. from a professionally recorded sound effects record/cd) or the music for jingles or stings (i.e.: a few seconds of music over which you may want to introduce your station or programme). It is very important that the music played back in the studio is as clear as possible. For that reason, records and record decks must be kept clean and free from dust. The stylus must be kept clean and handled very carefully. Some record decks and cds used in the studio have an automatic "fader start". This means that they'll start as soon as you open the fader for that piece of equipment. Before you play music into your programme, get to know the equipment.

• A **cassette player/recorder**: This is very useful but it also has certain limitations. If you want to record your programme (to listen back later) you can record it directly in the studio on cassette. You'll need to check first that the cassette player is connected to the mixer for both playback and recording. If you're recording your programme to be broadcast later, you should try to record it onto reel to reel tape, rather than cassette, which is generally of much lower quality. Because of its relatively poor quality, cassettes are not very good for playing music into your programme, especially if the cassette is a copy of a record or cd. Cassettes are also difficult to **"cue up"** exactly.



Cue up: in readiness for playing.

Talk about IC recorder/ flash recorder/ cellphone/ iphone-ipod-ipad/ android recorder

• Your studio may also have a **dat machine** for either recording or playback. Dat is very good quality, and is suitable for recording your programme onto for later broadcast.

• **Reel-to-reel machines**, again, for recording or playback. As with all pieces of equipment, make sure that you learn how to use it before you go in to make your programme. Although all reel-to -reel machines work in the same way, different machines have to be "threaded up" (i.e.: the way you put the tape from one spool to the other) differently; there are different ways of starting and stopping them; they can be played on different speeds; some have special editing features etc. Get to know your machine!

• **Cartridge machines**, for playing and recording jingles. These use a cartridge or cart which is a length of tape (the same as you use on reel-to-reel machines) that's wound inside a special plastic case. The two ends of the tape are connected up; so, it forms a loop. This means as soon as it gets to the end, it is back at the beginning again! Carts are generally made with lengths of tape that correspond to a certain number of seconds: e.g. 20"; 40"; 2'30" etc. They're especially useful for recording any short item that needs to be played repeatedly - e.g. jingles, community announcements, advertisements etc.



Jingles: short song or tune in radio. Eg: advertising jingle

- **Telephone,** for doing interviews, requests or talk-back programmes. Some desks have the facility to put phone calls out on air; this is done with the help of a telephone balancing unit or **tbu** for short. The presenter can hear the caller in his/her headphones and talk to them down the microphone. The quality of sound from telephones is much poorer than from most other sound sources, but they are clearly very useful for conducting interviews you otherwise wouldn't be able to get; or for programmes like phone-ins etc. If possible, try to make sure you have a reasonably clear line with the caller. If it's "crackly" or "echoey" the listener may have trouble understanding what's being said. It is possible to incorporate a delay facility so that nuisance phone calls can be faded out on live programmes.

- **Microphones:** Microphones convert the sounds you hear into electrical signals that can be recorded on to tape or hard disk. This means that choosing the right mic for the job at hand is critically important to getting the sound you want on your final tracks. It is very important to know what microphone you are to use in a given situation. Many people think that microphones (or mics as we colloquially call them) only pick up sound from sources they are pointed at. It's not true.

There are different types of microphones that can be used in different situations depending on their pick up patterns. Make sure of your programming requirements before purchasing the mics. Discuss with the supplier and make sure that you purchase the right kind of microphones.

Microphone patterns

Microphone **pickup patterns are as follows**:

1. Omni directional
2. Cardioid
3. Figure-Eight

1. An **Omni-directional microphone** can pick up sound from all directions irrespective of its point of origin. They are very easy to use and are the ones that are usually used when you have to pick location sound, audience reactions in a talk show etc.

2. A **Uni-directional microphone** can pick up sound only from one direction. You may have noticed in music shows that even though instruments are placed close to each other, the microphones placed above one instrument does not pick up the sound from another. Uni-directional microphones are best used for vocalists and music instruments. They are also widely used for recording in outdoor interviews and panel discussions in studio situations.

3. A **Bi-directional microphone** can pick up sounds from the front or the rear but does not respond to sounds from the sides. However, it is very sensitive. The distance between the source of the sound and the microphone is critical because bi-directional microphones tend to produce pops when not placed carefully. Bi-directional microphones are best avoided for outside work but can be used for discussions that have a group of four or five.



Pops: sudden short explosive sound

You don't need a special microphone to record in stereo, you just need two. A stereo microphone is actually two microphones that come together in one case. Stereo microphones are often expensive and come in professional models.

Cardioid

This describes a microphone's pickup pattern that is more sensitive to sounds directly in front of it than to sounds 90 degrees off to either side. A cardioid mic is even less sensitive to sounds directly behind it - in fact, cardioid mics practically cancel pickup of sounds emanating from directly behind the mic. This makes cardioid mics very useful for sound reinforcement (P.A.) and live recording use, as well as being the most popular choice for use in the imperfect recording environment of most home studios. To use a cardioid mic, simply aim the mic at the instrument you want to record, and the rest of the stage sound will be at least somewhat quieter than the desired instrument's sound. Most of today's most popular microphones have a cardioid pickup pattern.

There are a couple of variations on the cardioid pick up pattern. Supercardioid and hypercardioid mics are less sensitive to 90 degree off-axis sources than plain cardioids, meaning that they will do a better job of

rejecting sounds from off to the sides. However, hypercardioids do pick up some sound from directly behind the front of the mic, making them a little bit like a 'figure-eight' mic.

Cardioid mics exhibit a characteristic called the 'proximity effect'. The closer a sound source is to a cardioid mic, the more the mic will accentuate that sound source's bass frequency output. This can add richness and fullness to a singer's voice or to a saxophone's sound, but it can also **muddy** the sound of a guitar amp or acoustic bass. When miking from a distance, cardioid mics have a tendency to sound somewhat thin in the bass when compared to Omni directional mics. For this reason, cardioid mics are usually used for close-miking (with the mic placed less than two feet from the sound source), while Omni directional or figure-eight mics are usually used when miking from farther away.



Muddy: to make something difficult to understand

Figure Eight

Figure-eight mics have the 'open' sound and good bass response of Omni directional mics, with the added advantage that they reject sounds from either side of the mic. Since figure-eights pick up sound equally well from directly in back and directly in front, care should be taken that you don't capture undesirable reflections from low ceilings or nearby walls. A good place to use a figure-eight pattern mic is when you want to cancel reflections from side walls in a narrow-ish room but you want to capture a good sense of room ambience.

Microphones come in all sizes. While lavalier microphones also called button mics that can be pinned to a shirt or even a tie are best suited for interviews, akg microphones that are usually Omni-directional and the condenser mics that are pretty huge and even require power supply to operate them.

Since each microphone has a different purpose and pick-up pattern, using different microphones for different situations would be in order. Before purchasing microphones make sure that they serve your programming purpose.

Microphone types:

1. Dynamic
2. Condenser
3. Ribbon
4. Stereo

1. Dynamic microphones : Dynamic mics use a 'moving coil' to sense the changes in air pressure that make sound waves. The wire coil is suspended over a permanent magnet. When moving air hits the coil, it moves over the magnet, which causes electromagnetic induction to take place. This causes an AC voltage to be formed that is an electrical 'analogy' of the original sound. The electrical signal that appears at the mic's output is a more or less faithful reproduction of the original vibrations in air, only in fluctuating AC voltages instead of air pressure changes.

(i) Small diaphragm dynamic microphones: These are by far the most commonly used mics for P.A. and stage sound use. Dynamic microphones are typically very rugged and don't require a voltage source to work properly. Cardioid pattern, small diaphragm dynamic mics are most often used as handheld vocal mics (like the very common Shure SM-58) or as instrument mics for stage use (like the equally common Shure SM-57).

(ii) Large diaphragm dynamic microphones: While similar to their small diaphragm cousins, large diaphragm dynamic mics are typically used for very loud, bass heavy instruments such as tom-toms, kick drums, and bass amp speakers.

The larger diaphragm allows these mics to withstand higher Sound Pressure Levels (SPL's) with ease, but the larger moving mass of the larger diaphragm will limit the high frequency response of the mic. These characteristics also allow low-distortion reproduction of very loud instruments such as trumpets, trombones and electric guitar amplifiers. Some popular large diaphragm dynamic mics are: Electro-Voice RE-20 - a favorite of radio announcers and a good

mic for kick drums Shure SM-7 - similar to the E-V RE-20 Sennheiser MD-421 - commonly used on tom-toms and hand percussion

2. **Condenser microphones :** Condenser microphones capture sound using a conductive diaphragm with a capacitative charged plate behind it. The charge is supplied by a DC voltage source like a battery or the 48 volt 'phantom power' supply present in most mixers and mic preamps. Air pressure changes meeting the conductive diaphragm making it move, which causes an analogous AC voltage to be formed in the charged plate. These small AC voltages are sent out of the microphone to be further amplified. Because the diaphragm can be made very thin and light, condenser mics tend to be more accurate than dynamic mics, especially in the midrange and treble frequencies. Because of this low mass construction, condenser mics do tend to be more delicate than dynamic mics.

Condenser mics are more commonly used for studio recording more than for live sound and P.A., but there are some road-worthy condenser mics (like the Shure SM-87).

(i) Small diaphragm condenser microphones: Small diaphragm condenser mics have the best high frequency response of all the commonly available microphone types. For this reason, small diaphragm condenser mics are most often used as drum set overhead mics (to faithfully capture cymbals and stick attacks), for acoustic stringed instruments like guitars and violins, and for hand percussion instruments like vibraphones, shakers, and marimbas. Another common use for small diaphragm condenser mics is as stereo pairs for ambient pickup of acoustic events in good sounding spaces.

Some popular small diaphragm condenser mics are:

- Shure SM-81 - very flat frequency response; commonly used on acoustic guitars and as drum kit overheads.
- Audio Technica AT-3528 - a cardioid model that is sort of a 'poor man's KM-84'.

- AKG C 1000 S - a budget favorite. Neumann KM184 - a truly professional recording mic.
- Oktava MC-012 - from Russia, this is another mic made to be similar to the KM-84, but for a lot less money.

(ii) Large diaphragm condenser microphones: Since condenser mics are intrinsically more sensitive to higher frequencies, it is possible to combine the warmth and fullness of a large diaphragm with the high frequency detail typical of small diaphragm condenser mics into a single microphone. These large diaphragm condenser mics are the mainstay of the recording studios everywhere, especially for pop vocals and close miking horns. Some older vacuum tube based large diaphragm condenser mics, such as the Neumann U47, are collector's items prized for both their sonic warmth and their accurate reproduction of aural details. The 1960's vintage Neumann U87 is an FET-amplified, large diaphragm mic that is more of a modern classic.

Some popular large diaphragm condenser mics are:

- AKG CS 414 ULS - a standard for overhead drum miking and for general use; choice of cardioid, hypercardioid, omni, and figure-8 pickup patterns.
- AKG C 3000 B - a budget mic based on the design of the venerable CS 414; cardioid and hypercardioid only.
- Neumann TLM 103 - a new, lower-priced version of the famous U87; cardioid only.
- Audio Technica AT-4043a - a fabulous microphone for the price; cardioid only; great on saxophones.
- RODE NT1 - the new budget leader; cardioid only.
- CAD Equitek E-100 - another budget contender; super-cardioid only.
- Marshall Electronics MXL 2001-P - made in China, this is a very inexpensive, yet surprisingly smooth sounding mic; cardioid only.
- Oktava MC-219 - made in Russia, this is a classic budget 'sleeper'; cardioid only.

3. **Ribbon Microphone :** When a wafer-thin, small aluminum ribbon is suspended between two mounting points inside a strong magnetic field, you get a microphone that is extraordinarily sensitive to vibrations in air (sound). Ribbon mics can really capture the thump of a plucked acoustic bass or the subtle dynamics of jazz drums. Unfortunately, ribbon mics tend to be extraordinarily fragile (if dropped from your hand it is spoilt). Nevertheless, ribbon mics remain a favorite of recordists everywhere. Some common ribbon microphones: RCA BX-44 and BX-77 - the original classics. Coles 4038 - the standard in modern ribbon mics. Beyerdynamic M-260 - a budget ribbon mic; hypercardioid only

4. **Stereo Microphone :** By combining two cardioid condenser elements into one chassis, a single point stereo microphone can be made. The most common is the X-Y type, where the two cardioid elements are pointed away from each other at a 90 degree angle. Some stereo mics are of the Mid-Side (MS) type, using a combination of a forward-facing cardioid element with sideways-oriented figure-eight element, which allows for remotely controlled adjustment of the stereo image width. Some common stereo mics are: Audio Technica AT-825

Placement of microphones

In order to get the right sound for our radio programmes we should consider the following:

1 Kind of microphones

2 How many microphones to be used

3 Where and how to place them

4 The acoustics of the place, and

5 The perspective

Single microphone

Having chosen an appropriate microphone for your programme, mount it where the sound source is. Only make sure that the audio levels don't over shoot. Also, use the audio mixer to add bass to a light voice and remove bass if it becomes necessary to make it clearer. The ideal distance between the microphone and the sound source would be six inches.

However, if 'distorted' voice is what you are looking for, place the mic closer to the sound source.

When you place a music instrument close to the microphone, you will notice that it affects the way it is being recorded. Increase the distance and you will note a change in the timbre or some notes may be louder than others. Sometimes it also sounds 'hollow'. In order to avoid 'hollow' sounds, placement of mics is as important as having a good acoustically treated studio (see studio). A close in microphone will respond to some locations on the instrument more than others because the difference in distance from each to the mic is proportionally large.

Using more than one microphone : Your job is easy when you have to record using only one mic. However, when more than three people/sound sources are involved the placement of mics has to be carefully planned to gain optimum sound. Omni-directional microphones are usually used when there are more than four people for a discussion. One disadvantage of this technique is that the mics must be rather far from the panel to ensure that the mic is not too close to just one person and that only his voice is recorded prominently.

However, if you can afford separate mics for each of the sound sources then one can opt for a uni-directional button mic and balance the sound through an audio mixer.

Stereo : Stereo sound is an illusion of spaciousness that is a result of playing back a recording using two speakers. The main factors that establish the image (as radio is supposed to do) are the relative strength of sound in each speaker, and the timing of arrival of the sounds at the listener's ear. In a studio recording, the stereo image is produced artificially. Each sound source has its own microphone, and the various signals are balanced in the audio mixer.

Plan your mic placements on a sheet of paper. Do a rough sketch of the number of people involved in the recording and how they would be seated. This will enable you to decide what kind of microphones to use and how to place them for effective results.

Another important point to remember is that there is a difference between recording for transmission and recording for tapes. Some of the high frequencies are lost in transmission (most receivers have only one speaker) and this has to be borne in mind during recording.

Though all this sounds too very technical, in reality it is rather easy to do. Only, one needs practice. There is no wrong microphone in the strictest sense of the term for recording sound. Only, you have to know how to use them. This only experience will teach you. Start with two microphones and slowly increase their number to understand how to balance and mix their outputs on an audio mixer.

Taking care of mics : Now, let us discuss why and how we should take care of microphones. You should remember that mics are extremely sensitive and need to be handled carefully. Some do's and don'ts are given below;

Dos:

- Keep them in the pouches they are supplied with after use
- Keep them safely in an *almirah* or a box
- Keep mics away from moisture, water and fire
- Put off the mic after use.

Don'ts:

- Do not leave the cables with the mics. Do not dangle the mics holding the cables
- Don't keep them out in the open
- Don't expose mics to too much heat
- Don't drop the mics because then the components inside will be damaged.
- Do not tap the mics with fingers. Always speak into the mic to check its functioning.



CHECK YOUR PROGRESS

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

a. Faders

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b. Gain control

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c. Pre-fade switch

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d. Record deck/cd player

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e. Reel-to-reel machines

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f. Cartridge machines

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Q.4: What is a microphone? What is a condenser microphone?

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12.4 LETS SUM UP

1. What you want is to make a recording with the smallest amount of extraneous noise possible.
2. There are few important steps to be performed before recording. These are: Using a location where recording is within the control of the reporter, killing the noise, making equipments like Batteries, power cords and headphones ready, maintaining a comfortable environment for recording etc.
3. Central to the radio studio is the **mixing desk**.
4. In the mixing desk there are some **faders** which control how much volume comes out of the desk.

5. There are some important parts of mixing desk which are **gain control, pre-fade switch, vu and ppm meters** etc.

6. **Microphones, record desk, CD player, tape recorder, reel to reel machines, cartridge machines** etc. are some of the important equipment at the sound recording studio.

7. Microphone converts the sounds into electrical signals that can be recorded on to tape or hard disk.

8. The basic microphone pick- up patterns are: Omni directional, Cardioids and Figure-Eight.

9. An **Omni-directional microphone** can pick up sound from all directions irrespective of its point of origin. **Cardioids** pick-up pattern of microphone is more sensitive to sounds directly in front of it than to sounds 90 degrees off to either side. **Figure-eights** pick up sound equally well from directly in back and directly in front with added advantage that they reject sounds from either sides of the microphone and have 'open' sounds and good base response.

10. Microphones are of **four types:** Dynamic, Condenser, Ribbon and Stereo.

11. In order to get the right sound for our radio programmes we should consider the following: Kind of microphone, how many microphones to be used, where and how to place them, the acoustics of the place and the perspective.

12. The job is easy when we have to record using only one mic. However, when more than three people/sound sources are involved, the placement of mics has to be carefully planned to gain optimum sound. Omni-directional microphones are usually used when there are more than four people for a discussion.

13. In a studio recording, the stereo image is produced artificially. In **stereo recording,** each sound source has its own microphone, and the various signals are balanced in the audio mixer.

14. Microphones are extremely sensitive and need to be handled carefully.

12.5 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q.No 1: Outdoor interviews can become some of the most evocative radio programmes because they give the listener a sense of place. Instead of trying to eliminate all extraneous sound, you deliberately use the sound of the local ambience to enhance the meaning of the interview. If you do an interview outdoors, make sure that it is for a good reason. But to interview a doctor about breast cancer, don't do it in the park across from her office, because there is no reason for her to be there with all the traffic passing by to give away the location. But to interview a gardener about air pollution,it is a perfect place to choose. Again, while recording outdoors in very noisy environments, like street fairs or crowds, it is necessary to change the recording technique. In such cases we should turn your recording levels down and the mic very closely (within a few inches). By doing this we continue to highlight the interview while putting the ambience further into the background. It is still present, but it is likely to intrude less on the interview in the foreground. But when we are outside and deliberately working with environmental sound, it is even more important to collect the ambient tracks. We are to record a couple of minutes in the place where we do the interview and if there are specific sources of noise, such as birds or musicians or machines, that should be recorded separately and from a variety of distances. This makes it possible to create a full-scale ambient sound bed to run beneath the tracks in the final mixed piece.

Ans to Q.No 2 : When recording for radio, there may sometimes be situations when the AC is on or electrical circuits, such as those in old houses, generate a electrical hum or someone in the next room is making noise. All these extraneous sounds which may show up in the background of the recording if unchecked. Therefore, it is very necessary to listen to the recording that is going on- in the

studio or outdoors with the help of headphones. Listening to the interview through the headphones will tell us if we have this rare phenomenon. Headphones should always be used during the interview because it will eliminate all kinds of mistakes in the recording.

Ans to Q.No 3 :

a. Faders control how much volume comes out of the desk. The amount of faders on the desk varies - it usually depends on how much equipment we have. Ideally, each piece should have its own fader.

b. Gain control affects how much volume goes into each fader.

c. Pre-fade switch is used to switch the output of the fader to a set of meters, making it possible to check the levels before the fader is open. That is why it is called Pre fade switch.

d. In the studio, the record deck and cd are used to play music into the mixing desk (and out to the transmitter and the listener). Very occasionally, they may also be used for playing sound effects (e.g. from a professionally recorded sound effects record/cd) or the music for jingles or stings (i.e.: a few seconds of music over which you may want to introduce your station or programme).

e. Reel-to-reel machines are used for recording or playback.

f. Cartridge machines are used for playing and recording jingles. These use a cartridge or cart which is a length of a tape that's wound inside a special plastic case. They are especially useful for recording any short item that needs to be played repeatedly - e.g. jingles, community announcements, advertisements etc.

Ans to Q.No 4 : Microphones convert the sounds into electrical signals that can be recorded on to tape or hard disk. This means that choosing the right mic for the job at hand is critically important to getting the sound we want on our final tracks. It is very important to know what microphone to be used in a given situation.

Condenser microphones capture sound using a conductive diaphragm with a capacitative charged plate behind it. The charge is supplied by a DC voltage source like a battery or the 48 volt 'phantom power' supply present in most mixers and mic preamps. Air pressure changes meeting the conductive diaphragm causing it to move and it causes an analogous AC voltage to be formed in the charged plate. These small AC voltages are sent out of the microphone to be further amplified. Because the diaphragm can be made very thin and light, condenser mics tend to be more accurate than dynamic mics, especially in the midrange and treble frequencies. Because of this low mass construction, condenser mics do tend to be more delicate than dynamic mics.



12.6 FURTHER READING

1. Bhatt, S.C (1993) Broadcast Journalism- Basic Principles. Har-Anand Publications Pvt Ltd.
2. Baruah, U.L This is All India Radio. Publications Division
3. Belavadi , Vasuki (2007) Video Production. Oxford University Press
4. Sahay, Uday (2002) Making News-Handbook of the Media in Contemporary India . Oxford University Press
5. David, J (2007) Radio Broadcasting Journalism. New Delhi : Cyber Tech Pub
6. Kundra, Shipra (2005)Basic Audio Visual Media. Anmol Publications Pvt Ltd.

12.7 POSSIBLE QUESTIONS

Q.1. What are the basic recording techniques that are followed as far as radio is concerned?

Q.2. Explain the different microphone pickup patterns.

Q.3. What are the basic fetaures of a ‘figure-eight mic’?

Q.4. Good sound recording is very essential for a radio programme. Mention some measures that need to be taken when recording a programme for radio.

Q.5. ‘Microphones are of various kinds’. Justify and mention the kind of microphone/microphones you will use, and how you will position them when recording for a studio-based musical programme involving a tabla player, a vocalist and a harmonium player.