  
**Production and On Air Programming**  
**(BAJMC-208)**  
**Unit – 4**  
**Voice Personality and Presentation Techniques**  
by  
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**(Associate Professor, BVICAM, New Delhi)**  
**2023**

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**Unit 4- Chapter 1**

**Techniques of Radio Production**

- Basic Description of a Broadcast Chain
- Studio Center
- Sound Recording Equipments
- Recording Techniques

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**Introduction**

- Radio program requires the interconnected operation of electronic equipment and system such as microphones, mixers, amplifiers, transmitters etc.
- Radio broadcasting system consists of the following major sub-systems:
  - The studio centre
  - Studio-to-Transmitter Link (STL)
  - The transmitting centre
  - Radio propagation medium
  - Reception system (radio set).

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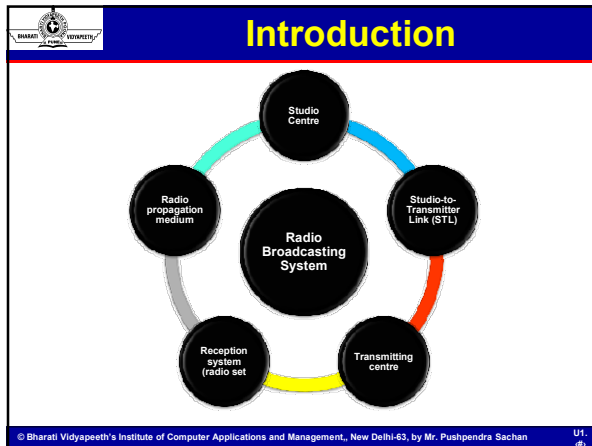
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**Studio Centre:**

- The studio centre is the place where the programmes are recorded, edited, produced, and played back at the time of transmission.
- Studio centre is again the origin of the programs with the concerned artists, performers, news reader, announcer etc.
- Apart from studios, the centre will also have facilities such as editing rooms, a control room and other related technical facilities.
- Different kinds of programmes need to be recorded in different acoustic conditions - Acoustic design of studios is primarily concerned with two parameters, namely, Noise level and Reverberation Time.

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**Noise level –** Noise is the unwanted sound in the studio.

- The sources of noise in a studio are the noise caused by airflow through AC ducts, leakage of external noise from adjoining corridors and rooms, and noise travelling through the building structure itself (vibrational noise).

**Reverberation Time -** Sound produced inside a studio travels outward, gets reflected from the studio walls, travels in a reverse direction, and again gets reflected and so on.

- The net result of these multiple reflections prolongs the life of a sound signal a little while, even after the cessation of the original sound. The phenomenon is called 'reverberation'.
- Reverberation adds 'lustre' and 'bulk' to the sound and adds to its richness.
- Too much reverberation, however, causes boominess, overlapping of individual sounds and loss of intelligibility

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**The required amount of noise isolation and reverberation are achieved in studio by –**

- covering the studio walls with acoustic material
- flooring with linoleum or thick carpet
- designing the door seals and observation windows in such a way as to prevent leakage of sound
- reducing air velocity through air-conditioning ducts and lining the ducts with sound absorbent material
- constructing the studio walls in a non-parallel fashion

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**Elements of Studio Centre** - A studio centre has the following elements

**Multi-purpose Studio:**

- These studios are those where a single studio is used for multiple purposes like - talks, drama, music, news etc.

**Transmission Studio:**

- This is for the purpose of playing back pre-recorded tapes interspersed by live announcements etc. in a pre-determined sequence.
- The number of transmission studios (also called as playback studios) would depend upon the number of broadcast channels that the station handles.

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**Announcer Booth:**

- An Announcer Booth is attached with the production studios
- While the actual program (talk/ discussion/ drama/ music concert etc.) takes place inside the studio
- the Announcer Booth serves various related works like keeping continuity with program from other studios, linking announcements, playing filler music and pre-recorded material, playback of pre-recorded music into the studio etc.

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**Control Room:**

- Control Room is the focal area at which all the technical activities in a studio centre converge.
- Sound recording technicians in the control room have overall responsibility for the technical operations in the studio.
- Control room requires a different kind of microphones, speaker and head phones & talkback microphone; audio mixer; computer having sound recording software and playback facilities for pre-recorded materials.
- Nuendo, Audacity, Sound forge, Cool Edit Pro, are a few names of software which are commonly used by professional sound recording studios.
- Audio-mixing is done through mixing console. The audio mixer not only controls the microphones but also controls other sources of sounds as well as the signaling lamp.

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**Studio-to-Transmitter Link (STL)** - The programs produced in the studio centre are electronically transported to the transmitting centre through the Studio-to-Transmitter Link (STL).

**The transmitting centre:** The transmitting centre is the place which houses the radio transmitter and the antenna system with the help of which the programs are transformed into 'radio' frequencies and radiated in the form of 'electromagnetic' waves.

- A transmitting centre may contain just one transmitter to cater to a single-channel station.
- Separate transmitter with a distinct 'carrier frequency' is essential for each broadcast channel.

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**Radio Propagation Medium** - The audio signals (programmes) delivered from the studio centre through STL are 'modulated' onto the carriers generated by the respective transmitters.

**Reception System:** Radio set (transistor, car radio, two-in-one etc.) receives these frequencies and separates the electromagnetic waves from carrier waves.

- Now these electromagnetic waves are converted back to electrical signals and then speaker of the receiving set convert these electrical signal to acoustic energy which the ear of human being able to listen to it.

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**Sound Recording Equipments**

These are the equipments required for recording the sound in a radio studio –

- Signaling Lamp
- Synchronized Clock
- Microphones
- Audio Mixer or Console
- Monitoring System
- Recording System

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**Sound Recording Equipments**

**Signaling Lamp –**

- A sound recording studio requires a signaling lamp (red in colour) in the booth, but operated by the control room, as a cue to the voice artist(s) to start a programme
- Simultaneously a red lamp outside the studio also glows as a warning signal for outsiders that the studio is now 'live'.



**Synchronized Clock –**

- A synchronized clock is required for accurate time keeping (master clock in the control room with its other clocks in all announcer booths and studios)

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**Sound Recording Equipments**

**Microphones –**

- The primary source of audio in any broadcast studio is the microphone.
- Microphone (Mike for short) is a device which converts sounds (acoustic energy) into electrical signals.
- These electrical signals are further amplified and processed in succeeding stages of the broadcast chain.
- There are different kinds of microphones such as Omnidirectional, Bi-directional and Uni-directional Microphones to suit different occasions, places and purposes.



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**Sound Recording Equipments**

**Audio Mixer or Console**

- Audio Mixer is the generic term for the sound recording console.
- Professional audio mixers for studio recording are available with 10 channels to more than 40 channels, with many facilities for handling the sound signal, such as, faders, equalisers, artificial reverb control, amplifiers, mixers, talk-back and filters.
- An audio mixer can be understood as an equipment to which all the sources (microphones, computer, CD player, speakers and amplifiers etc.) in the studio and sound recording booth are connected



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**Sound Recording Equipments**

**Monitoring System**

- Consists of an amplifier and loudspeakers.
- Amplifier is an electronic device by which sound signal level can be increased. Loudspeaker converts electrical signals from amplifier to sound waves for listening.
- The Audio Mixer gives output for feeding to the amplifier and this output from the mixer is called 'Monitoring output'.

**Recording System**

- Nuendo, Sound forge, Cool Edit Pro, are a few names of software which are commonly used by professional sound recording studios.

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**Recording Techniques**

Sound recording is a simple process of using a recorder to record music or spoken word. Sound recording is a technique involving sound pick-up, signal processing, recording including control of levels.

**Sound Pick-Up -**

- Sound pick-up is the most important factor in achieving quality recording
- Any deterioration in quality at this point cannot be rectified at later stages.
- Great care needs to be taken in assessing the quality of environment, choice of microphones and placement/use of microphones.

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## Recording Techniques

### Choice of Microphone

- A wide and flat frequency response is an important requirement in a microphone
- A microphone with roll-off at about 40Hz should suffice for most requirements.
- Directional microphones have maximum output for sounds coming from the front of the microphones
- Omni-directional microphone could be useful for interviewing a group of people in an open space
- Cardioid microphone would be needed if there is a noise source at 180 degrees to the desired sound source.
- Gun microphones are useful in picking up remote sounds like effects in sports events/questions in a press conference.

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## Recording Techniques

### Placement of Microphone

- Microphone should not be placed very close to reflecting surfaces
- Directional microphones should not be placed too close to a sound source to avoid boosting of low frequencies
- For spoken-word recordings, the microphone should not be placed directly in line with the mouth.
- The talker should not hold the script between his/her face and the microphone to avoid shadowing effect.

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## Recording Techniques

**Recording** - Two basic techniques of recording have evolved over the years. These are: Single Track Recording and Multi-Track Recording

### ❖ Single Track Recording

- All the sound sources are premixed into one/two channels for mono/stereo recording.
- Single Track Recording is quite useful as long as the complement of participants is small.
- However, when the number of microphones being used becomes large (say 6 or more), direct recording becomes a difficult task.

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 **Recording Techniques**

❖ **Multi Track Recording**

- Each microphone or a group of microphones may feed an individual track on the multi-track recording medium.
- Flexibility of building a recording piece by piece.
- Better control to create the desired balance in the end product.
- There is higher noise due to mixing of many narrow tracks
- It requires close coordination between the musicians, sound recordist and the program producer.

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 **Recording Techniques**

**Recording Process** - The process of multi-track recording may be broadly divided into two activities: Separation Recording, and Mix-down and Master Recording.

**Separation Recording**

- This sphere of activity comprises microphone selection, microphone placement and recording of individual channels on a multi-track recorder

**Mix-down and Master Recording**

- The maximum signal processing occurs during mix-down.
- Although the mix-down offers flexibility of repeated 'cut-and-try'

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 **Recording Techniques**

**Level Control**

- The sensitivity control is used to equalise sensitivity of different types of microphone used.
- The channel fader is used to adjust the level of the individual microphone and the master fader for adjustment of the overall level of the recording
- Most mixers are provided with peak level indicators in each channel.

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 **Unit 4- Chapter 2**

## Use of Music and Generating Sound Effects

- Introduction of Music in Indian Radio
- Forms of Music
- Formats of Music Programmes
- Special Types of Music
- Music Programme Production
- Sound Effects

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 **Introduction of Music in Indian Radio**

- Radio brought about a process of 'democratization' of music leading to an unprecedented interest in the forms and styles of India's ancient musical traditions.
- Broadcasting has also made substantial contribution in promoting awareness and appreciation of all forms of Indian music viz., classical, light, folk, western and orchestral music.
- The popularity of Radio is largely because of the variety and range of music and the artistes featured.

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 **Significance of music in radio**

- Music adds colour and life to any spoken word programme.
- Music can break monotony.
- Music is used to give the desired effect of happy or unhappy situations, fear or joy.
- Music can suggest scenes and locations.

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 **Forms of Music**

**Classical Music**

- India has an extensive repertoire of Classical Music.
- The country's musical geniuses have built up a rich legacy of classical music.
- It gets special patronage through radio network programmes to broaden the scope of listeners' tastes. Carnatic Music and Hindustani Music are the two off-springs of the parent Indian Classical Music

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 **Forms of Music**

**Light Music**

- This is light in nature.
- The tunes are based on classical melodies but liberty is taken to add or delete notes without strictly adhering to the classical values.
- Geet, Bhajan, Ghazal, Qawwalli are some popular forms of light music broadcast over radio.

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 **Forms of Music**

**Folk Music**

- Folk Music has been in existence long before classical music was born.
- It reflects the culture, tradition and lifestyle of a particular region.
- Each state has its own wealth of folk music.
- Radio Stations devote considerable time to broadcast folk music of different regions like, Brij, Halyanvi, Awadhi, Bhojpuri, Bangla, Tamil, Telugu, Malayalam, Kannada etc.

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## Forms of Music

### Orchestral Music

- In an effort to harmonise Indian melodies, a concept of 'VadyaVrinda' or Orchestral Music emerged in the early 50s.
- The National Orchestra known as AIR Vadyavrinda with units at Delhi and Madras has made significant contribution to orchestrations in Indian music

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## Forms of Music

### Western Music

- While Indian Music has developed on the concept of 'melody', Western Music is based on the theory of 'harmony'.
- Western Music includes Western Classical Music such as works of Beethoven, Mozart, etc., Country or Folk music, Pop music, Rock music, Jazz, Chamber music, Orchestral music etc.

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## Formats of Music Programmes

### Film Music

- The most popular music broadcast over the Radio is film music which attracts a large percentage of listeners.
- film based programmes are broadcast which include thematic songs, songs sung by one artist, songs of one music director, duets, songs of different periods, latest film hits etc.

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 **Formats of Music Programmes**

**Music Magazine**

- A Music magazine contains four to five items which may include interview with an eminent musician, an excerpt from a music festival, a straight talk on a relevant topic of music, a quiz programme on lyrics, composers, ragas etc.
- Certain points need to be carefully considered, such as the items included should be crisp, lively and the duration should not be very long; the linking lines should be interesting, natural and hold the magazine together

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 **Formats of Music Programmes**

**Musical Features and Operas**

- Musical feature is a programme which is basically musical in nature and the spoken-word is used to explain the music.
- Operas are musical plays, i.e., musical presentation of drama in which dialogues between various characters are musical in nature. The right kind of music can be set to the dialogue, depending upon the mood, situation etc.

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 **Formats of Music Programmes**

**Choral Music**

- Choral Music, as distinct from group singing, is popular in the west.
- A beginning was made in the seventies to produce choral music in broadcasts.
- Choral songs which are mainly patriotic in theme are selected from different languages keeping their lyrical value in view.
- It has both male and female voices in proper proportion along with instrumentalists, the rhythmist, violin player, flute player etc.

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 **Formats of Music Programmes**

**Music Appreciation Programmes**

- In order to create a taste for classical music, music appreciation programmes are broadcast.
- The producer aims to make the listeners understand and appreciate various aspects of classical music, i.e. the ragas, compositions, etc. in a simple manner, so that even a lay person without any background of music can flavor the richness of classical music.
- SangeetSarita a programme broadcast over VividhBharati is an experiment to popularize classical music with the common man.

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 **Formats of Music Programmes**

**Music Lessons**

- Music Lessons play an important role in educating listeners.
- Many serious students of music listen to such lessons, record them and try to learn by way of new compositions or raga, alap techniques, etc.

**Musical Discourse**

- Musical Discourse or Harikatha is another popular format in the south in which episodes from epics like Ramayana and Mahabharata are narrated interspersed with songs

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 **Music Programme Production**

**Planning Music Programmes**

- Planning of a music programme can be compared with planning a menu for serving dinner to a guest.
- Just as the host takes care of the taste of the guest, the variety of items to be prepared and the serving of the items in a proper order, similarly, a music producer treats the audience as guests to whom the delicacy of music is to be served.

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**Music Programme Production**

**Selection of Artistes**

- The selection of artistes is done with great care.
- Aspirant artists have to undergo an audition test, for which they should have good knowledge of the type of music they have to perform and should have undergone a systematic training etc.
- Once these formalities are completed the station calls the artistes for an audition test.

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**Music Programme Production**

**Selection of Instruments and Accompanists**

- The compatibility of the main artiste and the accompaniments largely accounts for the success of a performance.
- For a Classical Hindustani music item, the accompaniments needed are Sarangi, Harmonium, Tabla, Pakhawaj, whereas for Carnatic music, Violin, Mridangam, Ghatam, Khanjira, Morsing etc. are required.

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**Music Programme Production**

**Rehearsal**

- Rehearsal helps in going through the items so as to know, which instrumentalists should open the item; when to join in the middle; how much music to play; when and how to give the clue to the main artiste

**Seating Plan**

- A Seating Plan is made out by the producer indicating the seating arrangements for the vocalist and the instrumentalists and the microphone position for each.
- Fading-in, fading-out involves the use of the recording knob on the recording machine-by moving the knob in the clock-wise direction

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**Music Programme Production**

**Production**

- While recording a music programme with artistes seated or standing the placement of the microphone is important.
- The dead side of the microphone which does not pick up audio is to be avoided.
- A proper distance or 'balancing' is to be established between the performer and the microphone.

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**Music Programme Production**

**Post Production**

- After a well-rehearsed programme is recorded, there is not much of post-production work involved in single track or mono recording.
- In multi-track recordings, the producer of the programme records instruments and voices on different tracks and mixes them keeping a balance of the levels of individual track recordings thus requiring greater post-production work.

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**Sound Effects**

- Sound effects in a radio programme give meaning and sense of location.
- It adds realism to a programme and helps a listener to use imagination.
- In a radio program, a sound effect is a sound recorded and presented to make a specific storytelling or creative point without the use of dialogue or music.

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**Sound Effects**

- ❑ The term Sound Effect ranges back to the early days of radio. In its Year Book 1931 the BBC published a major article about "The Use of Sound Effects".
- ❑ It lists six totally different primary genres of Sound Effect
  - The Realistic, Confirmatory Effect
  - The Realistic, Evocative Effect
  - The Symbolic, Evocative Effect
  - The Conventionalized Effect
  - The Impressionistic Effect
  - Music as an Effect

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**Sound Effects**

- ❑ Foley is another method of adding sound effects. Foley is more of a technique for creating sound effects than a type of sound effect, but it is often used for creating the incidental real world sounds that are very specific to what is going on onscreen.
- ❑ With this technique the action onscreen is essentially recreated to try to match it as closely as possible. If done correctly it is very hard for audiences to tell what sounds were added and what sounds were originally recorded (location sound).

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**Sound Effects**

**Recording**

- The most realistic sound effects may originate from original sources.
- When the required sound effect is of a small subject, such as scissors cutting, cloth ripping, or footsteps, the sound effect is best recorded in a studio, under controlled conditions.
- Many sound effects cannot be recorded in a studio, such as explosions, gunfire, and automobile or aircraft maneuvers. These effects must be recorded by a sound effects editor or a professional sound effects recordist.

**Aesthetics**

- The job of designing the effect is mainly an issue of creating a conjectural sound which feeds the audience's expectations while still suspending disbelief. It is called the aesthetics.

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 **Techniques: Filter or distort**

**1. Echo**

- To simulate the effect of reverberation in a large hall or cavern, one or several delayed signals are added to the original signal.
- To be perceived as echo, the delay has to be of order 35 milliseconds or above.

**2. Flanger**

- To create an unusual sound, a delayed signal is added to the original signal with a continuously variable delay
- As long as the machines were synchronized, the mix would sound more-or-less normal, but if the operator placed his finger on the flange of one of the players (hence "flanger"), that machine would slow down and its signal would fall out-of-phase with its partner, producing a phasing effect.

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 **Techniques: Filter or distort**

**3. Phaser**

- Another way of creating an unusual sound; the signal is split, a portion is filtered with an all-pass filter to produce a phase-shift, and then the unfiltered and filtered signals are mixed.
- Phaser are often used to give a "synthesized" or electronic effect to natural sounds, such as human speech.

**4. Chorus**

- A delayed signal is added to the original signal with a constant delay.
- The delay has to be short in order not to be perceived as echo, but above 5ms to be audible

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 **Techniques: Filter or distort**

**5. Equalization**

- Different frequency bands are attenuated or boosted to produce desired spectral characteristics.

**6. Filtering**

- Frequency ranges can be emphasized or attenuated using low-pass, high-pass, band-pass or band-stop filters.

**7. Pitch Shift**

- This effect shifts a signal up or down in pitch

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**Techniques: Filter or distort**

**8. Time Stretching**

- the opposite of pitch shift, that is, the process of changing the speed of an audio signal without affecting its pitch.

**9. Resonators**

- Emphasize harmonic frequency content on specified frequencies.

**10. Synthesizer**

- Generate artificially almost any sound by either imitating natural sounds or creating completely new sounds.

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**Techniques: Filter or distort**

**11. Modulation**

- To change the frequency or amplitude of a carrier signal in relation to a predefined signal.

**12. Compression**

- The reduction of the dynamic range of a sound to avoid unintentional fluctuation in the dynamics

**13. 3D audio effects**

- Place sounds outside the stereo basis

**14. Reverse echo**

- It is a swelling effect created by reversing an audio signal and recording echo and/or delay whilst the signal runs in reverse.

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**Unit 4- Chapter 3**

**Use of Pre-recorded Features**

- Introduction
- News Reading Presentation Techniques

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 **Use of Pre-recorded Features**

- Radio program can be live, pre-recorded or a combination of both.
- Some radio features are pre-recorded and broadcast later as a part of Magazine format, News Bulletin or other radio programmes or used as independent programme for broadcasting.

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 **Use of Pre-recorded Features**

**Significance**

- Recorded productions allow supervision and control over quality.
- A pre-recorded feature like other programme format presents, facts based on documentary evidence about a relevant chosen topic or subject.
- Editing and post production are done at later time.
- Sometimes this can be combine with live production method. Portions or segments of a programme can also be produced as pre-recorded feature in advance, edited; and incorporated into production using live talent
- Many interviews are also pre-recorded and used late as the segment of some programme or broadcast as an independent programme.

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 **Unit 4- Chapter 4**

**Emerging Trends in Radio Industry**

- Introduction
- Emerging Trends in Radio Industry

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 **Emerging Trends in Radio Industry**

- The rapid advancements in technologies and the ever-extending areas of broadcasting given the new and innovating range of technologies and the delivery system increased attention is being paid to the contents which are expected to inspire, entertain, educate, enlighten and inform the listener.

**Emerging Trends in Radio Industry**

The changing trends may be broadly noticed in the following areas:

- Structures and Regulations
- Mode of Transmission
- Programme Concepts
- Production and Presentation.

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 **Changes in Structures & Regulations**

- The PrasarBharati (Broadcasting Corporation of India), an autonomous body was set up in 1997
- Three-tier system of providing national, regional and local services.
- There are three general types of local radio stations on the basis of funding, these are:
  - public service local radio station
  - commercial local radio station
  - community radio station
- **Broadcast Regulations** - PrasarBharati Act

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 **Changes in Mode of Transmission**

- Medium wave transmission has been the preferred mode of broadcasting in most of the areas.
- Short wave transmission has been supplementing it to enlarge the coverage.

**FM Radio:**

- FM is the frequency modulation system of transmitting radio programmes.
- FM transmitters can reach distances upto 70 kms unless obstructed by tall structures

**Sky Radio:**

- Sky radio refers to satellite-based broadcasting system.
- Radio programmes from the regional state capitals can be uplinked to the sub carrier available with TV carrier on the satellite.

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 **Changes in Mode of Transmission**

**Digital Audio Broadcasting (DAB):**

- Digital Audio Broadcasting (DAB) is the new genre of Broadcasting which employs 'digital' techniques of transmission and reception.
- The DAB procedure delivers a sound fidelity equal to that provided by a CD player right in the home.

**Internet Broadcasting:**

- The concept of Internet and its extreme popularity have opened another medium for radio transmissions.
- Audio signals can be converted into digital form and transmitted over the Internet.
- world-wide coverage and 24 hours accessibility

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 **Changes in Mode of Transmission**

**Stereo FM:**

- Stereophonic sound system uses more than one channel of sound information making it possible to create a two-dimensional sound.
- The stereo adds another dimension - direction of sound. It takes advantage of the delay in arrival of the sound at the two ears or the difference in intensity.

**Value Added Services:**

- The convergence of telecommunication, radio, television, cable, Internet and digital technology has brought in a new media situation often referred to as 'information super highway'.

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 **Changes in Mode of Transmission**

**Changes in Programme Concepts**

- Interactive programmes included "phone-in services", also called "phone-in radio".
- In a new interactive service called 'Radio on Demand' listeners can place music/song request through telephone.
- Entertainment-Education: Researches have revealed that social learning is easier when messages are conveyed in a play or drama format.

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**Changes in Mode of Transmission**

**Changes in Approach to Production and Presentation**

- **Presentation:** In a radio programme presentation, particularly of a public service broadcasting organization has been emphasizing 'formal' manner of presentations.
- It is more of an 'announcement' than presentation.
- The advent of FM as a separate music channel and induction of private producers in FM broadcasting has led to the development of a new cadre of Radio Jockeys (RJs).
- They present film and pop music programmes in an innovative way often involving a free style where the RJs make witty statements and jokes.

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**Changes in Mode of Transmission**

- **TRACT (Transportable Communication Terminal)** with direct access facility to the satellite is available with the radio networks.
- **Recording:** Instead of the conventional way of recording, ultraportable and portable recorders, and the console receivers' computer hard disc-based recording, editing and playback systems are introduced to enhance the efficiency and quality of programme production.

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**Emerging Trends in Radio Industry**

**Emerging Trends in Radio Industry**

The radio industry evolves with technological advancements and changing audience preferences.

- **Podcasting:** On-demand audio content accessible anytime, anywhere.
- **Streaming and Internet Radio:** Online platforms expand reach and engagement.
- **Personalization:** AI-driven recommendations based on listener preferences.
- **Interactive Content:** Real-time audience participation through social media or live shows.
- **Diversification:** Incorporating video content, live streaming, and multimedia elements.

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