

TELEVISION AUDIO AESTHETICS

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TELEVISION SOUND

- Sound may refer to any aural component of a program that is intentionally present. Noise on the other hand, interferes with sound. It makes it more difficult to understand. Noise becomes an intentional element introduced into a programme.
- Video field producers are concerned with sound in three different aspects; location recording, adding sound to prerecorded video tape (audio dubbing) and sound manipulation during post production. The producer should have a clear understanding of the nature of sound, the capabilities and limitations of sound on audience perceptions.



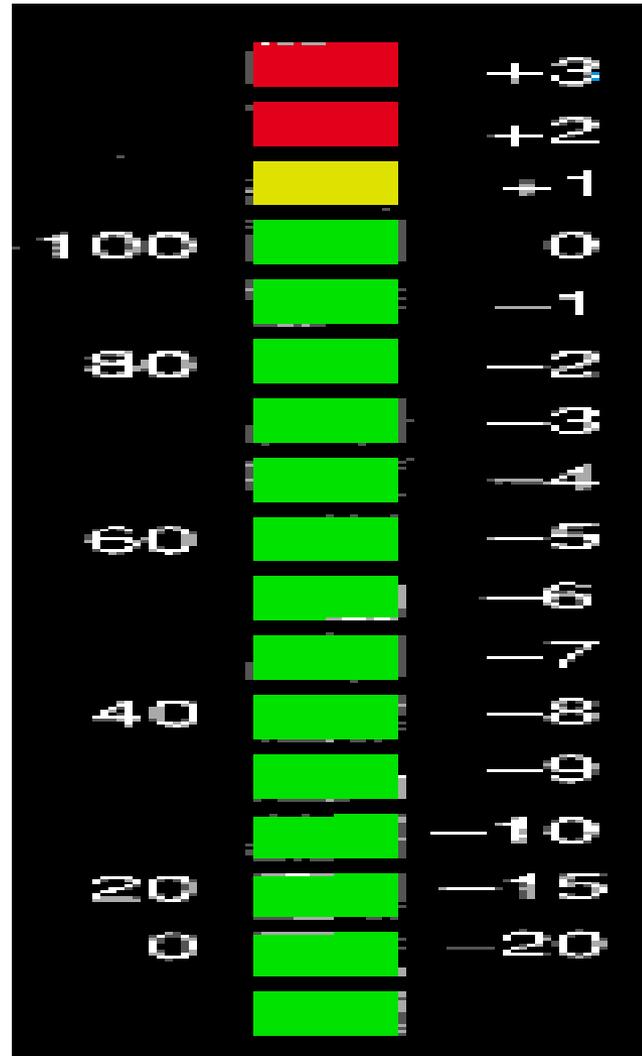
Sound has two basic characteristics that must be controlled: loudness (intensity or amplitude) and frequency.

- **Loudness:** This refers to how high or low the sound is. This is usually measured in decibels (dB). Decibels represent the level of electrical power going through various pieces of audio equipment.

Sound Intensity

- The differences in the loudness or intensity of sound can be seen as differences in the amplitude or height of the sound wave. Amplitude is measured in decibels (db) standard unit for the measurement of the relative intensity or volume of sound.

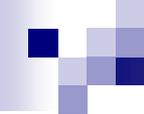
Loudness





Frequency

- Frequency relates to the basic pitch of a sound -- how high or low it is. The frequency refers to the way in which some sound waves are higher or lower than others.
- Frequency is measured in Hertz (Hz) or cycles per second (CPS). A person with exceptionally good hearing will be able to hear sounds from 20-20,000 Hz.

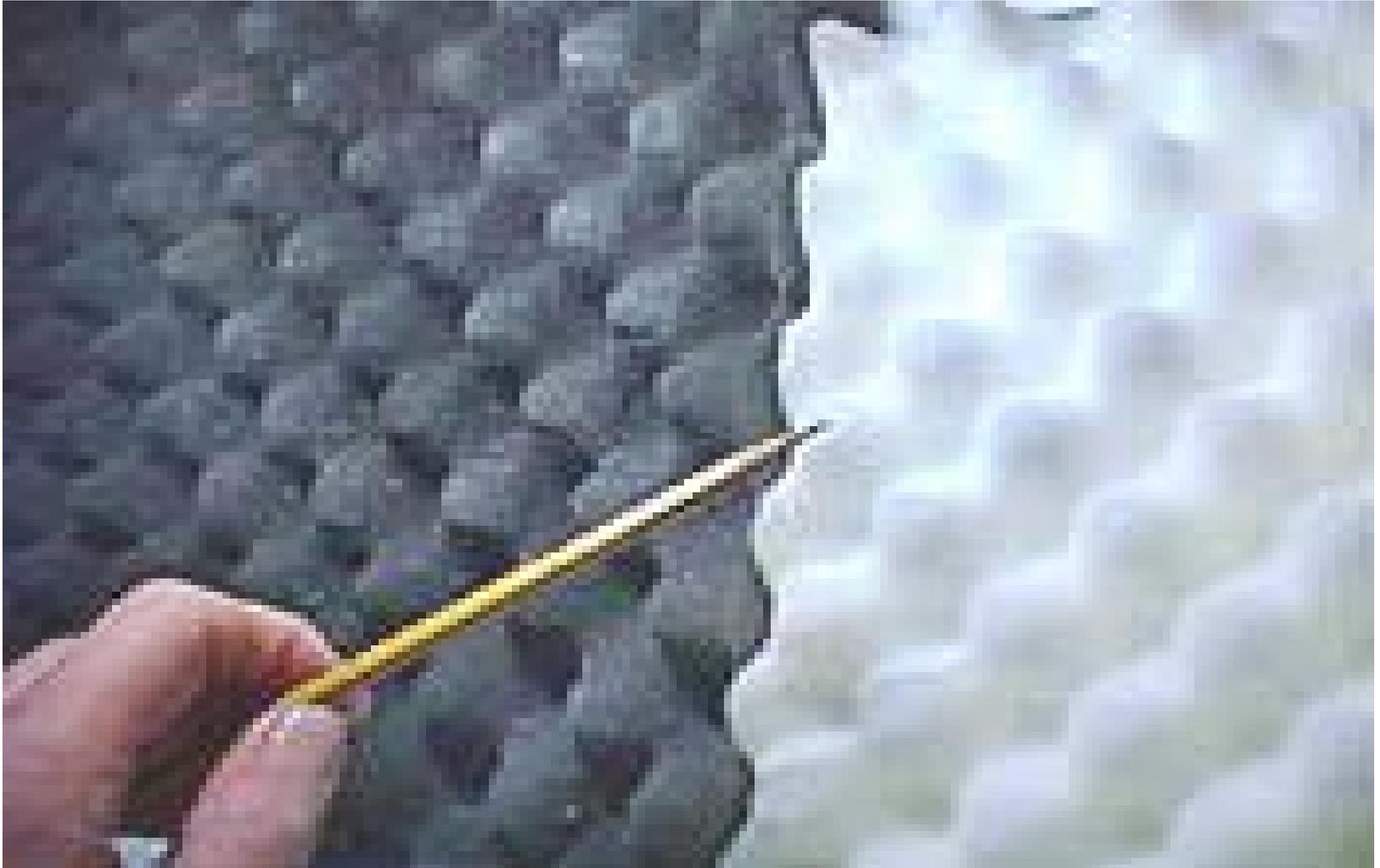


Room Acoustics

- Sound, both as it is recorded and played back, is more affected by the acoustics of a room or studio than most people realize.
- In an effort to create totally soundproof studios, some Television stations used to use thick carpets on the floors and heavy soundproofing on the walls. But modern production uses sound booths.

- Although possibly successful as soundproofing, the result was a lifeless and dead effect that we're not used to hearing in a normal listening situation, such as our living room. Therefore, a slight bit of reverberation is both desirable and realistic.
- A room with a tile floor and hard, parallel walls will reflect sound so much that it interferes with the intelligibility of speech. Sometimes it's desirable in these situations to place free-standing sound absorbing items in the room -- things like sofas and rugs -- to break up sound reflections and reduce reverberation.

Soundproofing



Microphones

Sound is picked up and channeled into the video recording system with a microphone. Microphones transducer (transform) sound waves into electric energy to form the audio signal. In order to ensure that you have good sound, the microphone is one of the elements that need to be controlled. The choice of a microphone and its placement will depend on the particulars of given recording settings.

Types of Microphones

a) Way of use:

Handheld microphones - the type held by on-camera talent or used for on-location interviews

Desk Microphone - The desk microphone is attached to a small stand and placed on a desk or table top. The front of the mike should be pointed in the direction the announcer will normally face during the production. Desk mikes are very sensitive to external noise. Announcers should be reminded not to tap or kick the desk.

Types of Mics cont'd

- **Personal mics** (lavalier / clip-on mic) - Whether hung from a cord around the neck (lavalier) or clipped to clothing, these are all referred to as personal mics.
- **Shotgun** – used for on location production to pick up sounds a moderate distance from the camera
- **Boundary effect microphone:** also called PZ or PZM microphones. These rely primarily on reflected sounds from a hard surface such as a tabletop

Types of Mics cont'd

- **Contact mics** – which pick up sound by being in direct physical contact with the sound source. These mics are generally mounted on musical instruments.
- **Stand Microphone** - This is basically a hand held microphone positioned on a tall stand and frequently used by singers or placed near musical instruments. The stand microphone is normally preset to the subject's height for ease of use.

Types of Microphones

b) By characteristic:

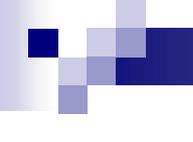
- **Dynamic mic:** also called a moving coil microphone. In a dynamic microphone sound waves hit a diaphragm attached to a coil of fine wire. The coil is suspended in the magnetic field of a permanent magnet. When sound waves hit the diaphragm they move the coil of wire within the magnetic field. As a result, a small electrical current is generated that corresponds to the original sound waves. This signal must be amplified thousands of times.

Dynamic Mics cont'd

- This type of mic is a good choice for electronic newsgathering (ENG) work, where a wide variety of difficult conditions are regularly encountered (such as this ENG report on a fire).

Dynamic Microphone





Condenser Microphones

These microphones are capable of top-notch audio quality. They can be made so small that they are almost invisible. (But, the smaller they are, the more expensive they tend to be!) Condenser mics aren't as rugged as dynamic mics, and problems can result when they are used in adverse weather conditions.

Condenser Mic



Condenser Mic cont'd

- Because they require a pre-amp, unlike the dynamic mics discussed earlier, most condenser mics require a source of power, either from an AC (standard Alternating Current) electrical power supply or from batteries.
- An AC power supply for a condenser mic is sometimes built into an audio mixer or audio board. This is referred to as a phantom power supply. When this type of power supply is used, the mic cord ends up serving two functions: it delivers the signal from the mic to the mixer and it carries power from the mixer to the pre-amp of the condenser mic.

Directional Mics

In microphones there are three basic directional categories:

- **Omni directional Mics**, also called non-directional mics are sensitive to sounds coming from all directions. One of their advantages is that they are less sensitive to breath popping and close mouth-to-mic use, such as a reporter doing an ENG report. However, in general video production where the mic isn't hand-held it's almost always more desirable to use some form of directional mic.

Directional Mics

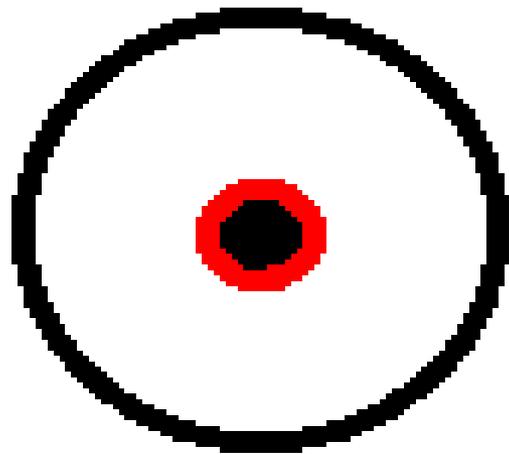
- **Bi-directional mics:** This is where a mic is primarily responsive to sounds from two directions. Although commonly used in radio interviews for people sitting across from each other at a table, until the advent of stereo, bi-directional (also called *figure eight*) sensitivity patterns had limited use in television. We'll get into stereo and the need for this type of directional pattern in a later module.

Directional Mics

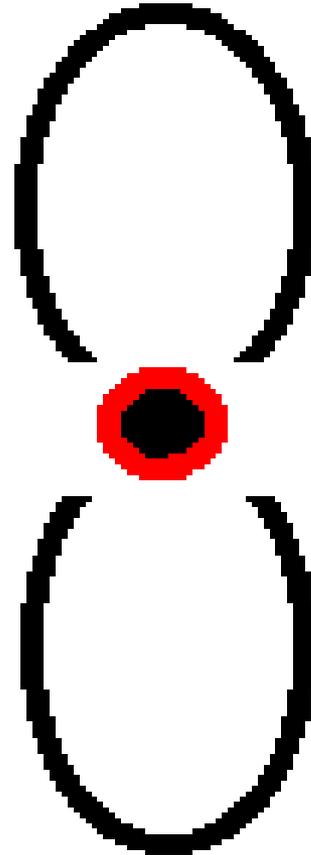
- **Uni-directional mics.**

This simply refers to a general classification of mics that are sensitive to sounds coming primarily from one direction. Although these terms may sound as if they belong in a medical textbook, they simply refer to how narrow the mic's pickup pattern ("angle of view") is. There are four subdivisions in this category -- each being a bit more directional:

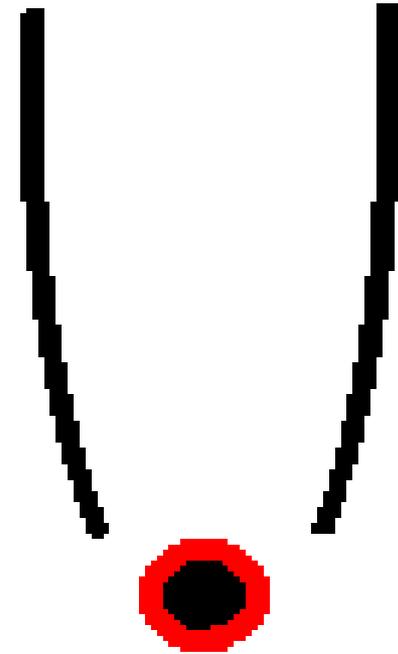
Directional Mics



**Omnidirectional
(nondirectional)**



Bi-directional



Unidirectional

Unidirectional mics

Cardioid: The cardioid (pronounced car-dee-oid) pattern is named after a sensitivity pattern that vaguely resembles a heart shape. Mics using a cardioid pattern are sensitive to sounds over a wide range in front of the mic, but relatively insensitive to sounds coming from behind the mic. Although this pattern might be useful for picking up a choir in a studio, the width of a cardioid pattern is too great for most TV applications. When placed two or more meters (7 or more feet) from a speaker, it tends to pick up unwanted, surrounding sound, including reverberation from walls.

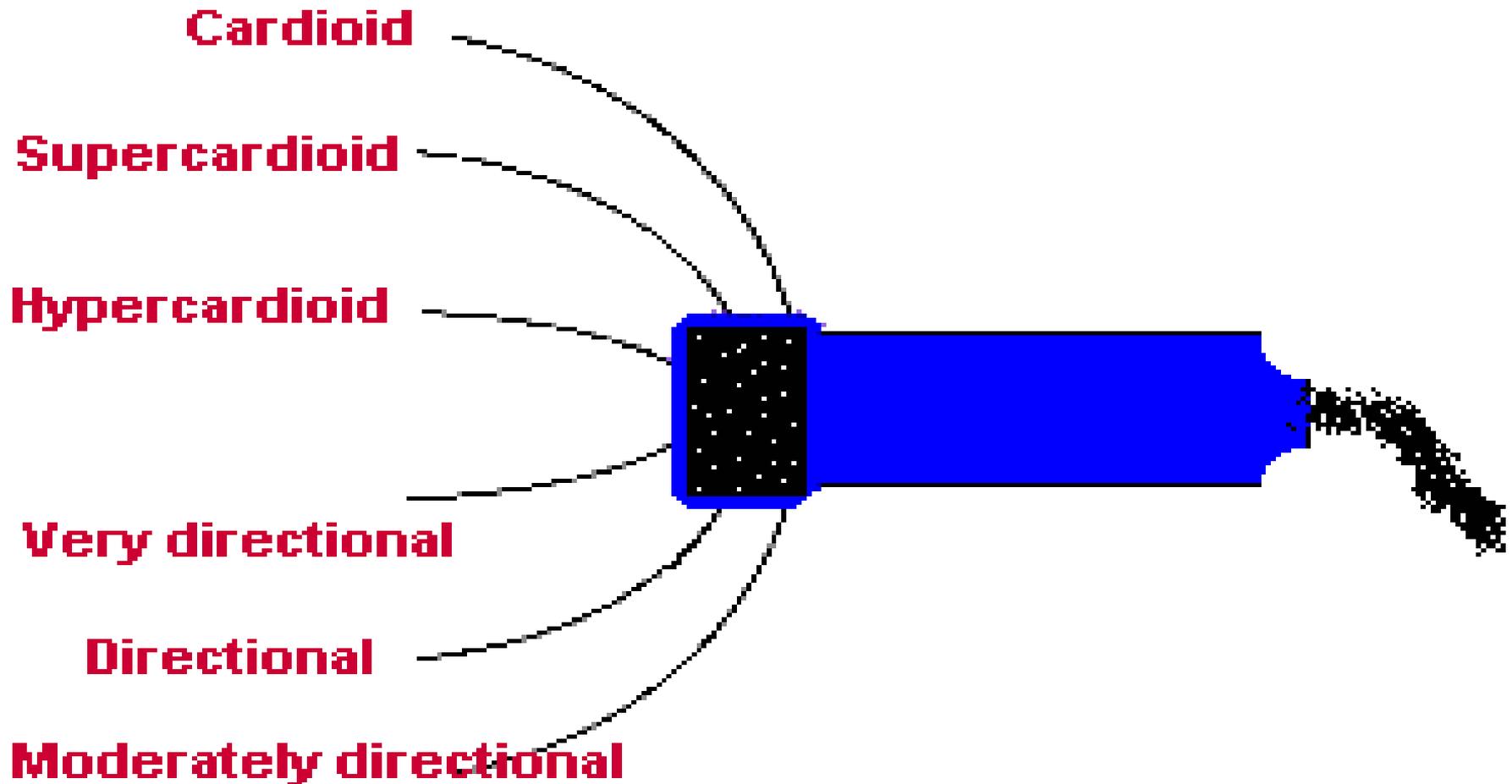
Unidirectional mics

Supercardioid: The supercardioid is even more directional than the cardioid sensitivity pattern. Whereas the cardioid has about a 180-degree angle of acceptance, the supercardioid has about 140-degrees of coverage. When this type of mic is pointed toward a sound source, interfering (off-axis) sounds tend to be rejected. This polar pattern is similar to that of our ears as we turn our head toward a sound we want to hear and try to ignore interfering sounds.

Unidirectional mics

- **Hypercardioid and Lobar:** Even more directional are the hypercardioid and lobar patterns with less than 140-degrees of coverage. Because off-axis sounds will be largely rejected, they have to be accurately pointed toward sound sources. Highly directional mics should not be used close to talent because they exaggerate bass. In addition to on-location settings, they are useful in stage and PA applications where amplified speakers are being used, because they can deliver higher audio levels before feedback starts.

Unidirectional mics cont'd

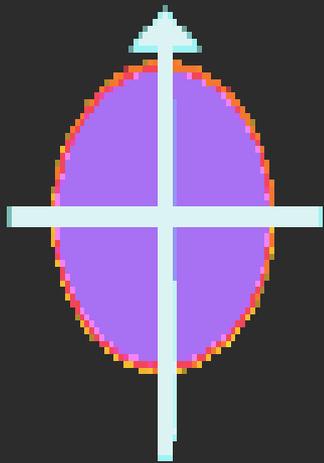


Microphone sensitivity patterns

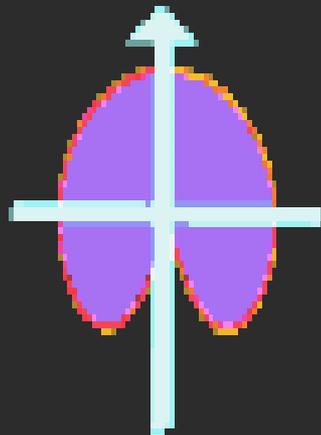
- The drawing below shows another way basic microphone sensitivity patterns (polar patterns) can be visualized. These drawings represent top views of the microphones and the light blue arrows represent the direction the mics are pointed. The magenta areas represent the areas of maximum sensitivity.

Microphone sensitivity patterns

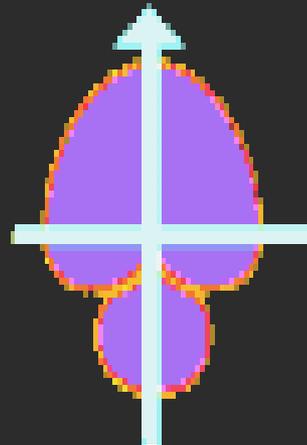
Basic Microphone Sensitivity Patterns



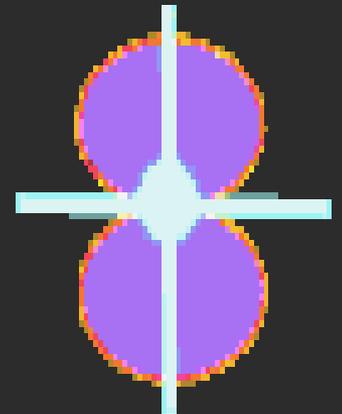
Omnidirectional



Cardioid



Supercardioid



Bidirectional

Handheld Microphones

- Handheld mics are often dynamic mics because they are good at handling momentary sound overloads. Although they are commonly called "handheld," the term is a bit of a misnomer, because this type of mic can also be mounted on a microphone stand.
- Because these mics are often used at close distances, some special considerations should be mentioned. First, it's best if the mic is tilted at about a 30-degree angle (as shown here) and not held perpendicular to the mouth.

Handheld Microphone



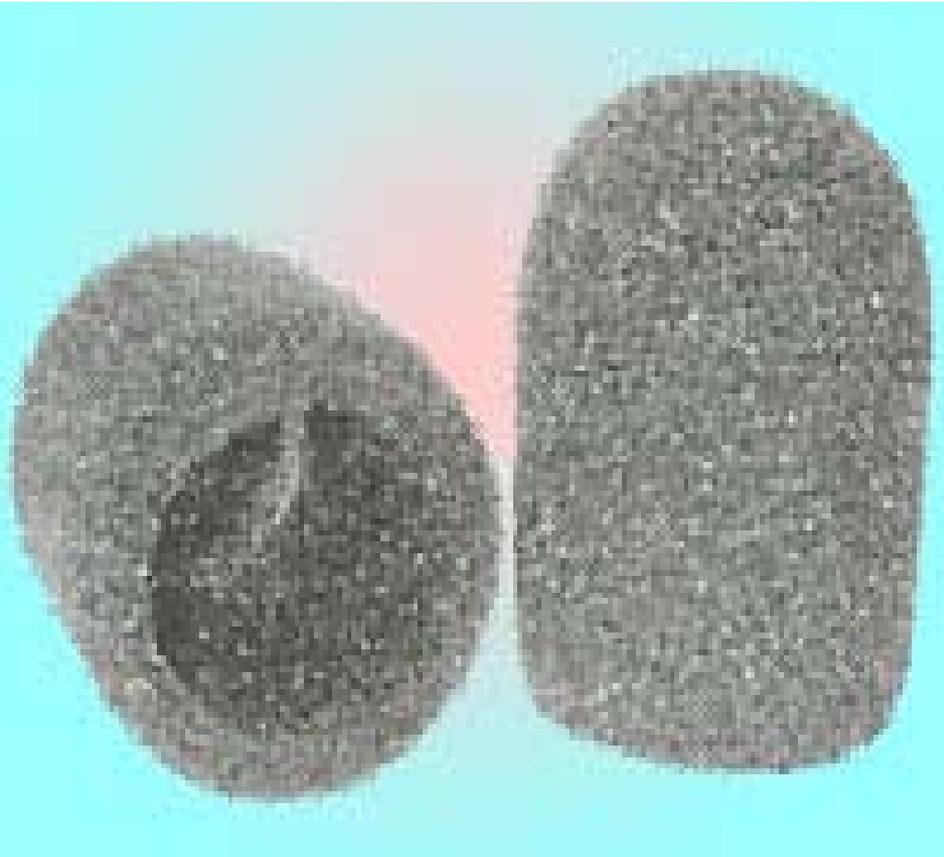
Handheld Microphones

- Speaking or singing directly into a mic often creates unwanted sibilance (an exaggeration and distortion of high-frequency "S" sounds), pops from plosive sounds (words with initial "Ps," and "Bs"), and an undesirable proximity effect (an exaggeration of low frequencies).
- Pop filters, which are designed to reduce the pops from plosive sounds, are built into many handheld mics.
- When a mic is used at close range, it's also wise to slip a windscreen over the end of the mic to further reduce the effect of plosive speech sounds.

Handheld Microphones

- In addition to reducing the effect of plosives, windscreens can eliminate a major on-location sound problem: the effect of wind moving across the grille of typical microphones. Even a soft breeze can create a turbulence that can drown out a voice.

Pop filters



Positioning Handheld Mics

- When a handheld mic is shared between two people, audio level differences can be avoided by holding the mic closer to the person with the weaker voice. Inexperienced interviewers have a tendency to hold the mic closer to themselves.
- The resulting problem is compounded when the announcer has a strong, confident voice, and the person being interviewed is somewhat timidly replying to questions.

Personal Microphones

- Personal mics are either hung from a cord around the neck (a lavalier or lav mic) or clipped to clothing (a clip-on or lapel mic).
- This general type of mic can be either a condenser or dynamic type.

Personal Mics



Personal Mics continued

- When attaching a personal mic, it should not be placed near jewelry or decorative pins. When the talent moves, the mic can brush against the jewelry creating distracting noise.
- **Hiding Personal Mics Under Clothing:** Often, these mics are hidden under clothes. However, great care must be taken in securing the mic, because annoying *contact noise* can be generated when the talent moves and the clothing rubs against the mic.

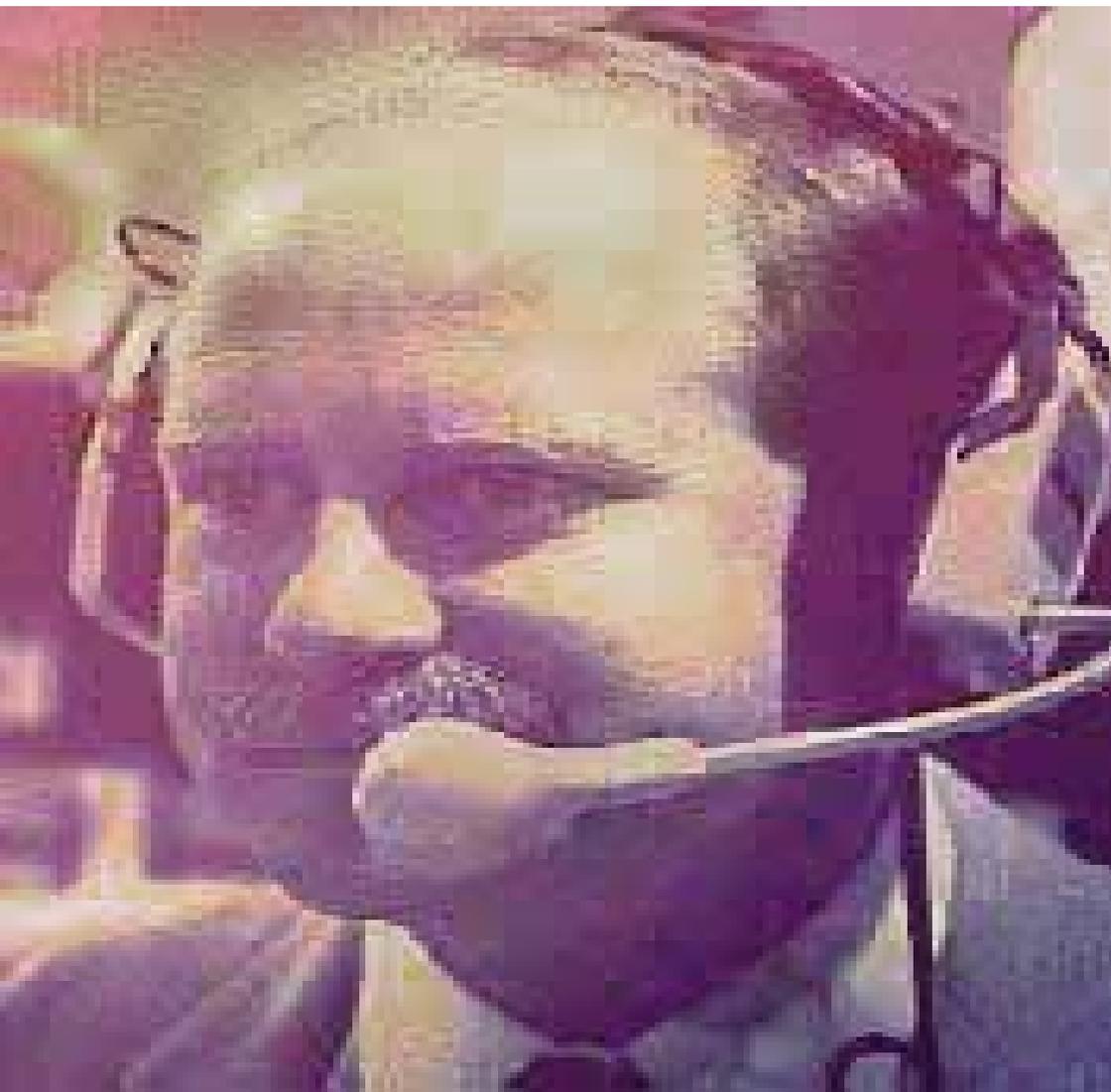
Personal Mics continued

- ***Forced Perception:*** Finally, when some hidden personal mics are used, the proximity of the mic to the person's mouth can result in unnatural sound — a kind of sterile sound that's not what you would expect in a typical room. This is called *forced perception*.

Headset Mics

- The headset mic was developed to serve the needs of sports commentators. Normally, a mic with a built in pop-filter is used. The padded double earphones carry two separate signals: the program audio and specific director cues. Having the mic built into the headset assures a constant mic-to-mouth distance, even when the announcer moves from place to place.

Headset Mics cont'd



Mic Connectors

- To ensure reliability, mic and general audio connectors must always be kept clean, dry, and well aligned, without bent pins or loose pin connectors.
- The two connectors on the left of this photo are female and male Cannon or XLR connectors. These three-pin connectors are used in professional audio applications.
- To the right of the Cannon connectors are the mono and (with the floating center connector) stereo miniature connectors. Finally, on the right of these is the RCA-type connector, which is common to most home entertainment equipment.

Mic Connectors



Positioning Mic Cables

- Running mic cables parallel to power cords often creates hum and interference problems. The solution is often as simple as moving a mic cable a meter away from any power cord.
- Fluorescent lights can also induce an annoying buzz in audio. Computers and certain types of medical equipment, especially if they are near audio cables or equipment, can also create undesirable noise.
- By carefully listening to your audio pickup with a set of high-quality, padded earphones, you can generally catch these problems before it's too late.

Wireless Microphones

- Wireless mics can solve many audio problems in production.
- They are especially useful when talent must be free to roam, such as when doing an ENG report from the lighthouse shown here. At the same time, wireless mics can introduce problems.
- In a wireless mic, a dynamic or condenser microphone is connected to a miniature frequency modulated radio transmitter. Because the mic's audio signal is converted into a radio frequency (wireless) signal and transmitted throughout the production area, these mics are also referred to as RF mics.

Wireless Microphones

- There are two types of wireless mics: the self-contained (all-in-one) unit and the two-piece type.
- In the self-contained, handheld unit, the mic, transmitter, battery, and antenna are all part of the microphone housing.
- When small, unobtrusive clip-on mics are desirable, a two-piece wireless unit is the best choice.
- In this case the mic is connected to a separate transmitting unit that can be clipped to the belt, put in a pocket, or hidden underneath clothing.

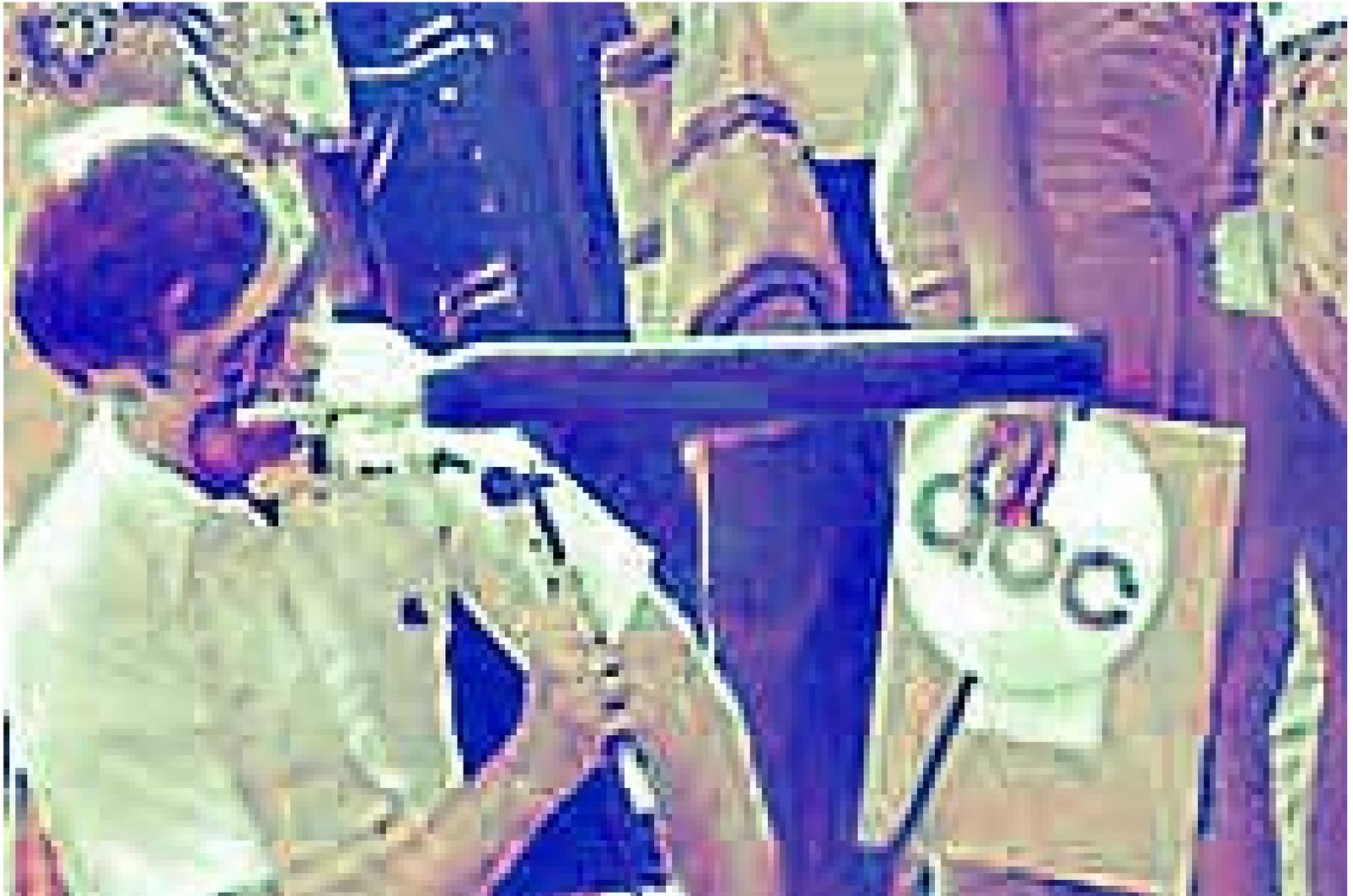
Wireless Mics

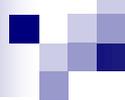


Using Off-Camera Microphones

- Although it may be appropriate to use handheld, lav, or RF mics for interviews, there are instances in television production when it's desirable to use an unseen microphone. Examples would be:
 - - because seeing a mic wouldn't be appropriate, as in the case of a dramatic production
 - - when mic cords would restrict the movement of talent, such as in a dance number
 - - when there are too many people in the scene to use multiple personal, handheld or RF mics, such as with a choir
 - - During investigative reporting, where you do not want the source to know what you are recording

The Shotgun Mic





The Shotgun Mic

- Because of their highly directional characteristics shotgun mics can be used out of camera range at distances of up to 10 meters (25 to 30 feet).
- As with all directional mics, they have to be carefully aimed, preferably with the aid of high-quality earphones.

The Shotgun Mic

Shotgun mics are often mounted on --

- **Fishpoles:** The quickest solution for picking up audio, especially in on-location shooting, is to attach a directional mic to a pole and have someone hold it just out of camera range.

As the name suggests, a fishpole consists of a pole with a mic attached to one end.

A sound person equipped with an audio headset can monitor the sound being picked up and move the microphone according to changes in camera shots and talent position.

Microphone Booms

- In the studio the simple fishpole moves into the much more sophisticated category of boom mic.
- Microphone booms range from a small giraffe (basically a fishpole mounted on a tripod) to a large perambulator boom that weighs several hundred pounds, takes two people to operate, and can extend the mic over the set from a distance of 10 meters (more than 30 feet)

Microphone Booms

- The largest booms have a hydraulically controlled central platform where operators sit and watch the scene on an attached TV monitor while controlling such things as the
 - left or right movement (swing) of the boom arm
 - boom extension (reach of the arm)
 - left to right panning of the attached microphone
 - vertical tilt of the microphone

Boom Mic



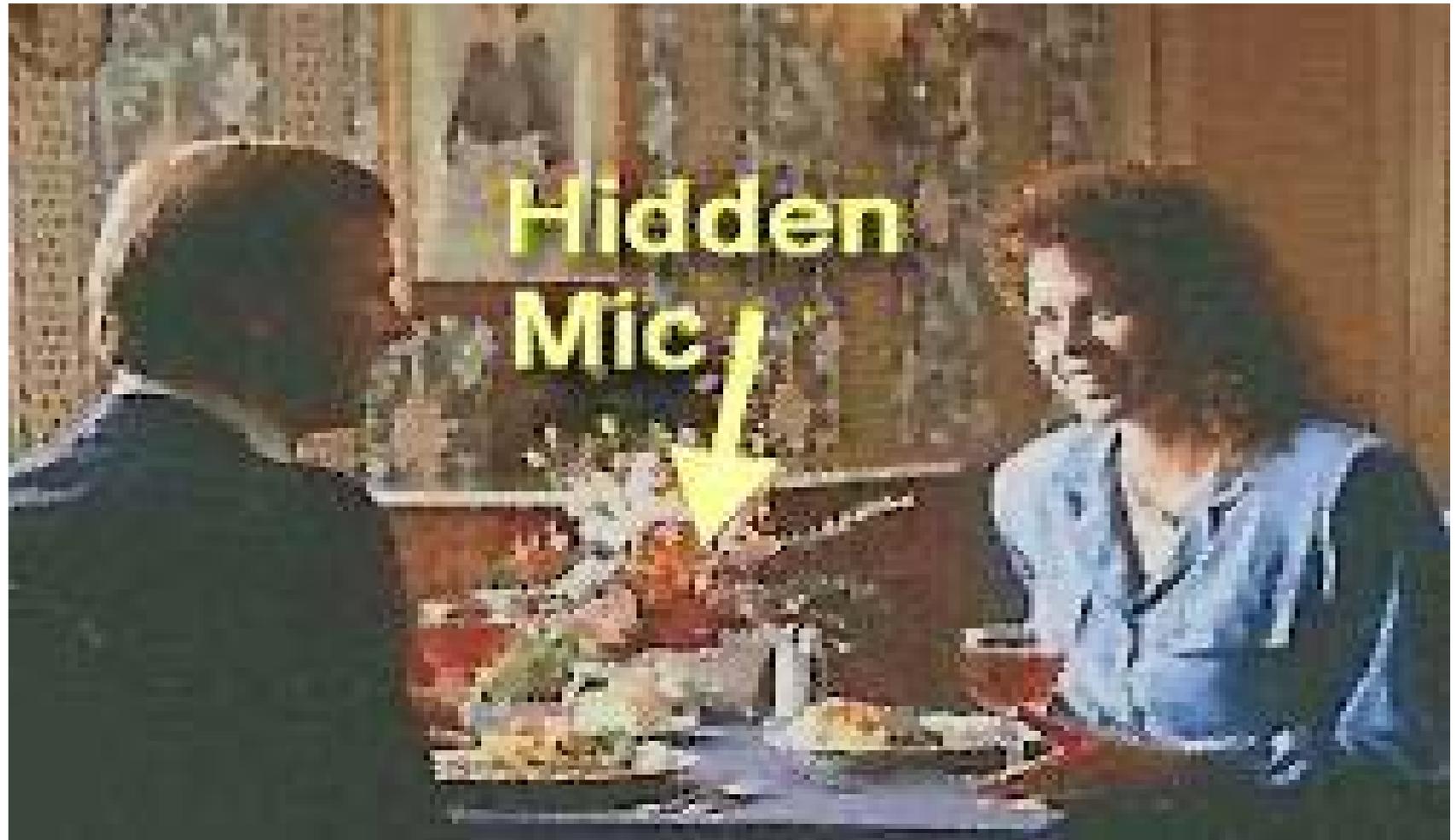
Hanging Microphones

- Often, you can get by without a boom mic, especially if the talent is confined to a limited area.
- For example a mic can be suspended over a performance area by tying it to a grid pipe or fixture just above the top of the widest camera shot. The disadvantage of this approach, of course, is that the mic can't be moved during the production.
- Both boom mics and suspended microphones should be checked with the studio lights turned on to make sure they do not create shadows on backgrounds or sets, or interrupt camera shots.

Hidden Microphones

- It is sometimes possible to hide microphones close to where the on-camera talent will be seated or standing during a scene. This will eliminate both the need for personal or handheld mics and the problems that the associated mic cords can introduce.
- Microphones are sometimes taped to the back of a prop or even hidden in a table decoration.
- When placing mics, keep in mind the proximity effect discussed earlier. You may find during an editing session that the audio from different mics used at different distances will not "cut together" (edit together) without noticeable changes in quality.

Hidden Microphones



Stereo, Quad and 5.1 Sound

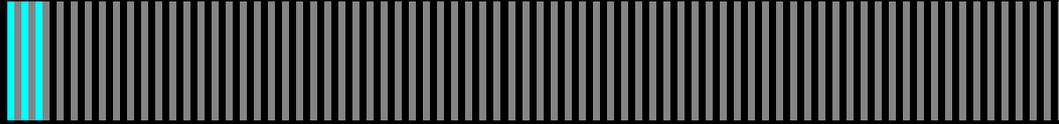
- Our ability to locate where sounds are originating is possible in part because we have learned to unconsciously understand the minute and complex time-difference relationship between the sounds from our left and right ears.
- If a sound comes from our left side, the sound waves will reach our left ear a fraction of a second before they reach our right ear. We've learned to interpret this subtle time difference, which, technically, is known as a *phase difference*.

Stereo, Quad and 5.1 Sound

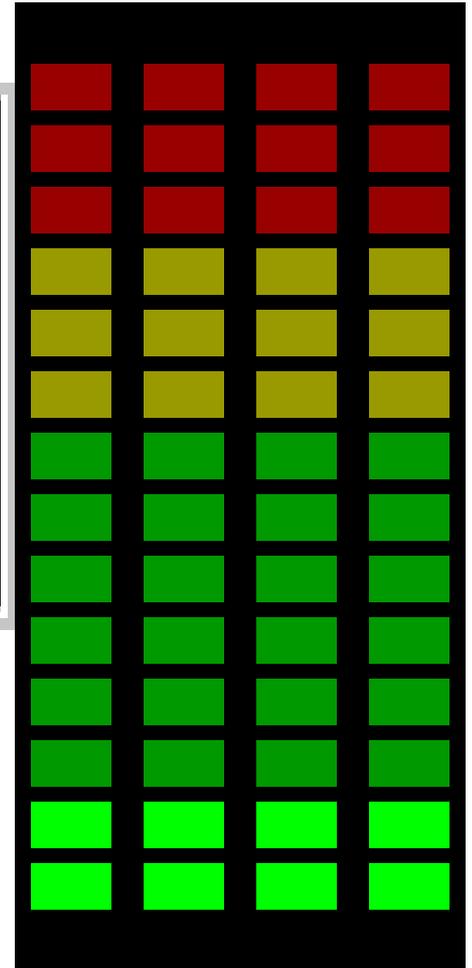
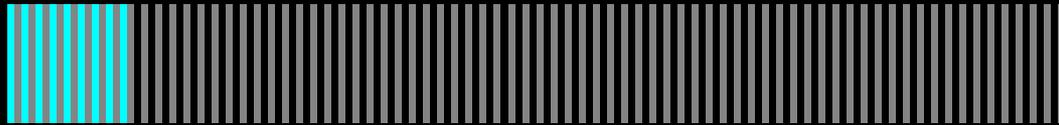
- Depending upon the location of a sound, we might also note a slight difference in loudness between sounds that occur on our left and sounds coming from our right — which also helps us place the sound in a three-dimensional perspective.
- In stereo production we are dealing with sound intended for our left and right ears, and the inherent differences represented. Therefore, recording and playing back stereo signals requires two audio channels.

Stereo

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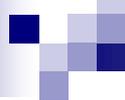


R



Creating the Stereo Effect

- In TV production there are several approaches to creating the stereo effect.
- First, there is synthesized stereo, where stereo is simulated electronically. Here, a monaural (one channel, non-stereo) sound is electronically processed to create the effect of a two-channel, stereo signal.
- A slight bit of reverb (reverberation, or echo) adds to the effect. Although this is not true stereo, when reproduced through stereo speakers, the sound will be perceived as having more dimension than monaural sound.
- An elaborate audio board can also accomplish this. True stereo is only possible if the original sound is recorded with two microphones, or a microphone with two sound sensing elements.



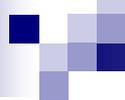
Audio Control Devices

Boards, Consoles, and Mixers

- Various sources of audio must be carefully controlled and blended during a production.
- Beyond this, audio sources must be carefully and even artistically blended to create the best effect.
- The control of audio signals is normally done in a TV studio or production facility with an audio board or audio console.

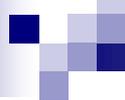
Audio controls cont'd





Boards, Mixers, Consoles

- Audio boards and consoles are designed to do five things.
- amplify incoming signals allow for switching and volume level adjustments for a variety of audio sources
- allow for creatively mixing together and balancing multiple audio sources to achieve an optimum blend



Boards, Mixers, Consoles

- Route the combined effect to a transmission or recording devices
- Sophisticated audio boards or consoles also allow to manipulate specific characteristics for audio. These include left-to-right placement of stereo sources, altering frequency characteristics of sound, and adding reverberation.

The roles of sound

- Sound does not simply accompany pictures. It contributes subtly to their effectiveness.
Through music or sound effects, you can create illusion; suggesting a time or place, a situation.
- To explain the picture
- To interpret the picture
- To augment the pictures meaning
- Strengthen the picture's impact
- To enrich the pictures appeal

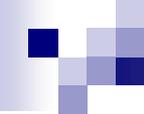
Types of sound used in production

- **Voice:** This is the most common type used in video production. The two most common uses of voice are dialogue (interview) and narration. **Dialogue** is conversation between two or more people. May be scripted or unscripted.
- **Narration:** This is the extreme use of the voice. It seeks to serve as a link to various portions or segments of a program for the viewer. This can be done on camera and this is called sound on tape and when done off camera, its called a voice over.

- **Natural Sound:** Natural sound is extremely important in video production as it differentiates field productions from studio productions. Natural sound is often referred to as location sound or ambient sound. Its sound present in the location in which the action is taking place
- **Music:** The principle use of music in video editing is to create mood. It can be used as an indicator for location and time. Music also performs an important cuing function, tells us when something new is about to happen. It can be used to introduce themes or as a punctuator in various programmes.
- **Sound effects:** Sound effects are often used to preset the natural sounds of the location being depicted. Sound effects are used widely in studio and remote productions to suggest that something is happening off camera. For a sound effect to be

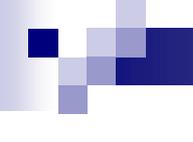
Using Audio Recordings

- Voiceovers/reporter narrations or to explain the picture thereby reinforcing the story.
- Sound can be used to create continuity (bridge) for otherwise unrelated shots.
- As sound inserts e.g the telephone voice of an eye-witness over news items shots
- Helps devise atmospheric sound picture for subjects where no sounds actually exist e.g sculpture, painting, architecture.
- Use of associated sounds were absent when shooting a scene e.g birdsong then add later.
- As pre-recorded substitute during a live show e.g an artist miming to own music



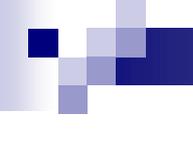
Sound treatment

- Audio can be manipulated to produce many unusual effects.
- Quality changes e.g audio filtering, distortion
- Reverberation
- Pitch changes
- Speed changes
- Reversed sounds
- Repeated sounds (stutter effects)



Interrelating picture and sound

- The scale and quality of sound and picture should match
- They should synchronize if the visual action and sound are related
- Switching between pictures is best done to the beat of music rather than against it
- Pictures and sound should normally begin and end together

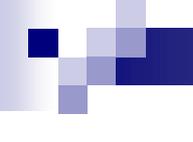


Practical Audio problems

Ideal sound: Too quiet sounds can be lost against background noises, while too high sounds will be distorted

Relative volumes: Problems arise when using a single microphone to pick loud sounds and quiet ones at the same time

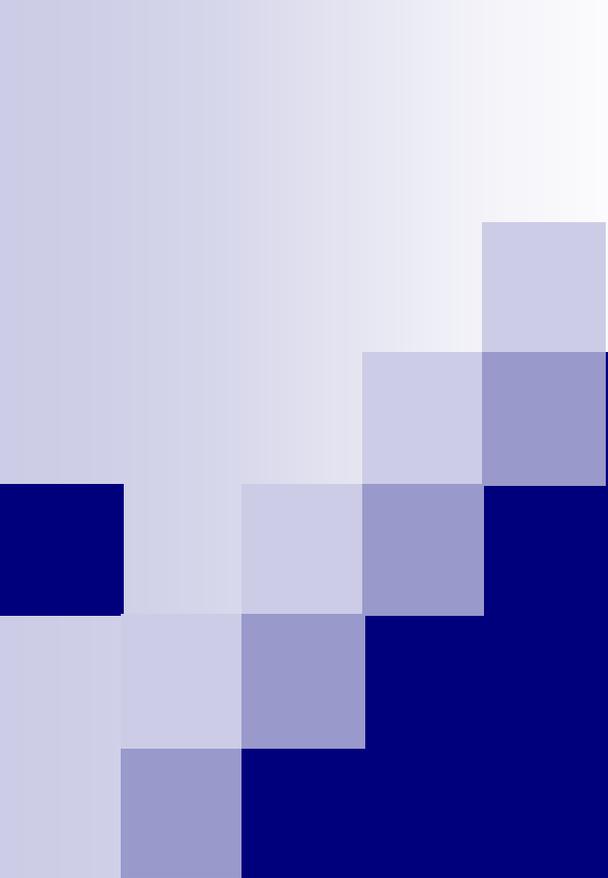
Distracting sound: Mics tend to exaggerate sounds around us, that we naturally tend to ignore.



Practical Audio problems

Linking sound and the picture, and divided attention while shooting. We need to take care that volume and quality of sound is reasonably consistent throughout a scene. Managing a moving object.

Poor mic and other equipment management



Thank You!

Any Questions?