



# THE ABC OF TELEVISION SOUND : TRANSDUCER

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# Agenda

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- ❖ What is a Microphone ?
- ❖ How the microphone hears
- ❖ How the microphone works
- ❖ What type of microphone should you use?
- ❖ How to hold your microphone?
- ❖ Hearing what your microphone will hear?
- ❖ Where to position your microphone?
- ❖ Microphone Maintenance.



# WHAT IS A MICROPHONE ?

- ❖ Is a transducer.
- ❖ A transducer is a device that converts one form of energy into another.
- ❖ Microphone refer to as Mic.
- ❖ Mic changes the announcer's voice into an electrical signal that can then be mixed with other sound sources.
- ❖ There is no one correct mic to use in radio production work, but specific types of mics will work better than others in certain situations.

# WHAT IS A MICROPHONE ?

- ❖ Good mic converts acoustic energy into electrical energy.
- ❖ It reacts equally to all levels of pitch.
- ❖ When a presenter gets too close to the mic, the bass may be exaggerated – termed Proximity Effect.
- ❖ Mic has electronic and operational characteristics.

# ELECTRONIC CHARACTERISTICS

NIA

- ❖ Sound - generating element.
- ❖ Pick up patterns.
- ❖ Microphone features.

# OPERATIONAL CHARACTERISTICS



## ❖ Mobile microphones.

✓ Lip/Clip/Neck Mic.

✓ Handheld Mic.

✓ Boom Mic.

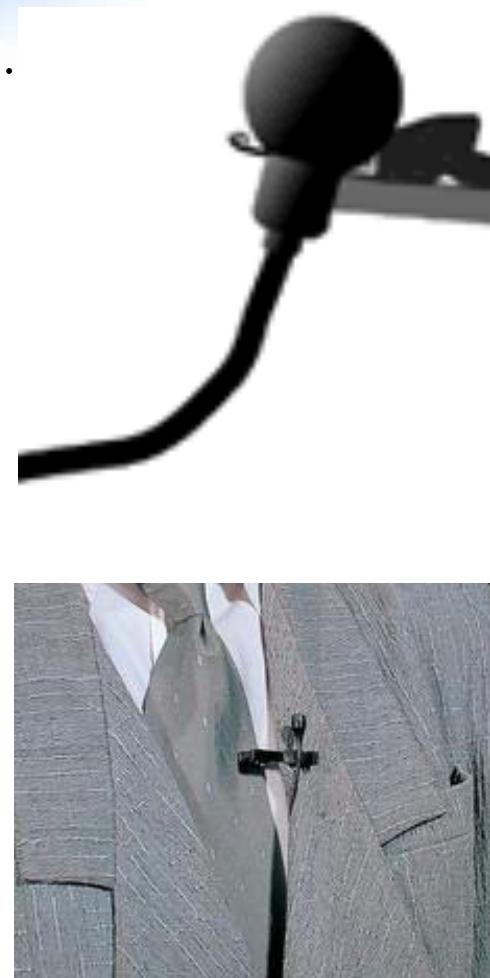
✓ Wireless Mic.

## ❖ Stationary Microphones.

✓ Desk mic, Stand mic, Hanging mic, Hidden mic & Long-distance mic

# CLIP MICS

- ❖ Often used in TV as they're less obtrusive. Clip mics are usually small omni mics, and come in a box. There are a variety of sizes, but they're all small enough to clip on to clothing.
- ❖ Where you clip the mic is very important - too far from the voice and it will sound distant; too close to the chin and it can sound muffled.



# CLIP MICS

- ❖ You need to consider your interviewee's clothing - taffeta and other stiff fabric will rustle. And if you clip a mic to a man's shirt, make sure that his tie doesn't fall across the mic.
- ❖ The use of clip mics frees the lighting people from lighting around the boom to avoid shadows.
- ❖ Installed 5 to 8 inches below the chin.



# TYPES OF MICROPHONES

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- ❖ DYNAMIC MIC
  
- ❖ CONDENSER MIC
  
- ❖ RIBBON MIC

# DYNAMIC MIC

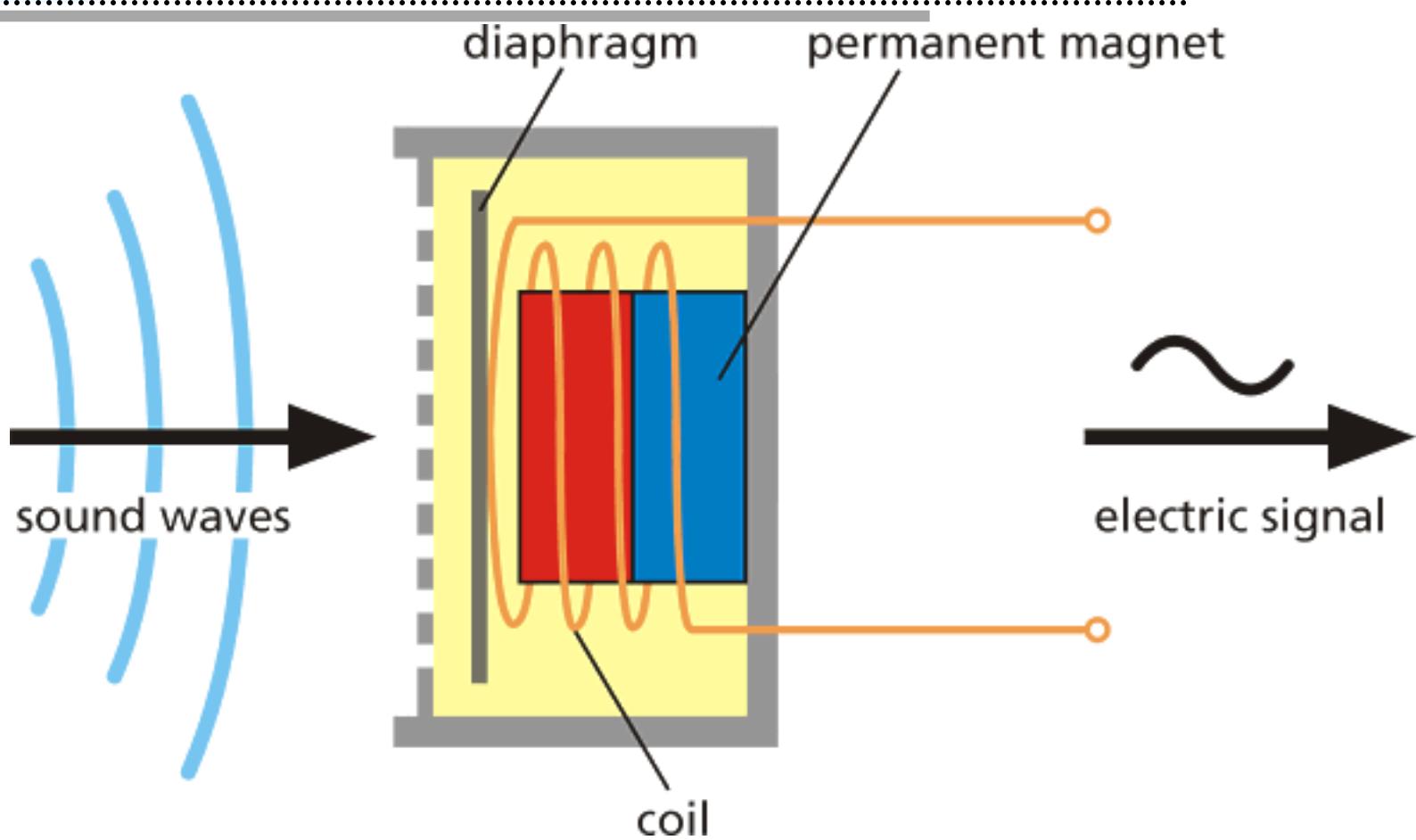
- ❖ Moving – coil mic / Pressure mic.
- ❖ Relatively simple construction.
- ❖ Cheap.
- ❖ Produces very low self noise & has excellent frequency response.
- ❖ Can withstand a moderate amount of abuse.



# DYNAMIC MIC

- ❖ Does not satisfactorily reproduce sound levels.
- ❖ Rugged.
- ❖ Sound not as detailed as other types.
- ❖ Handle extremely high sound levels.
- ❖ Ideal for outdoor applications & music – drums, vocals, guitar.

# DYNAMIC MIC



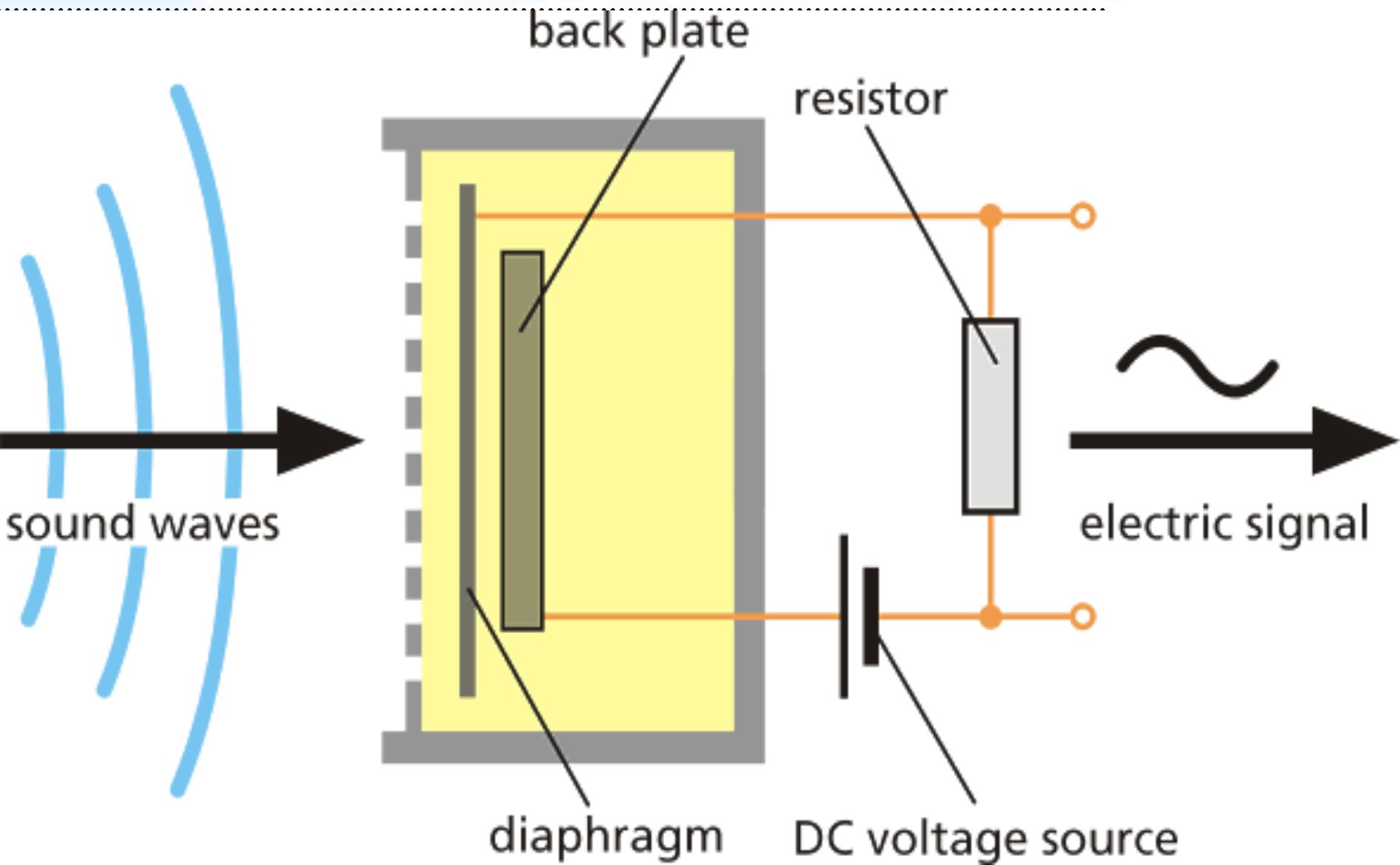
# CONDENSER MIC

- ❖ Capacitor Mic/ Electret condenser mic.
- ❖ Needs a small battery to operate.
- ❖ Much more sensitive to physical shock.
- ❖ Produces excellent sound quality & wide frequency response.
- ❖ Higher sensitivity, provides a smoother, more natural sound.

# CONDENSER MIC

- ❖ Built-in mic on many portable audio recorders are often CM.
- ❖ Useful for “distant” recording applications such as room mics, overheads & choirs.
- ❖ Better suited to high frequency transduction.
- ❖ More complex than dynamics, tend to be costly.
- ❖ Not as rugged as dynamic mics.

# CONDENSER MIC



# RIBBON MIC

- ❖ Also known as ribbon velocity mic.
- ❖ Uses a thin aluminum, duraluminum or nanofilm of electrically conductive ribbon placed between the poles of a magnet to produce a voltage by electro magnetic induction.
- ❖ Typically bidirectional mic, meaning that they pick up sounds equally well from either side of the mic.
- ❖ Once delicate & expensive, but modern materials make it durable.

# RIBBON MIC

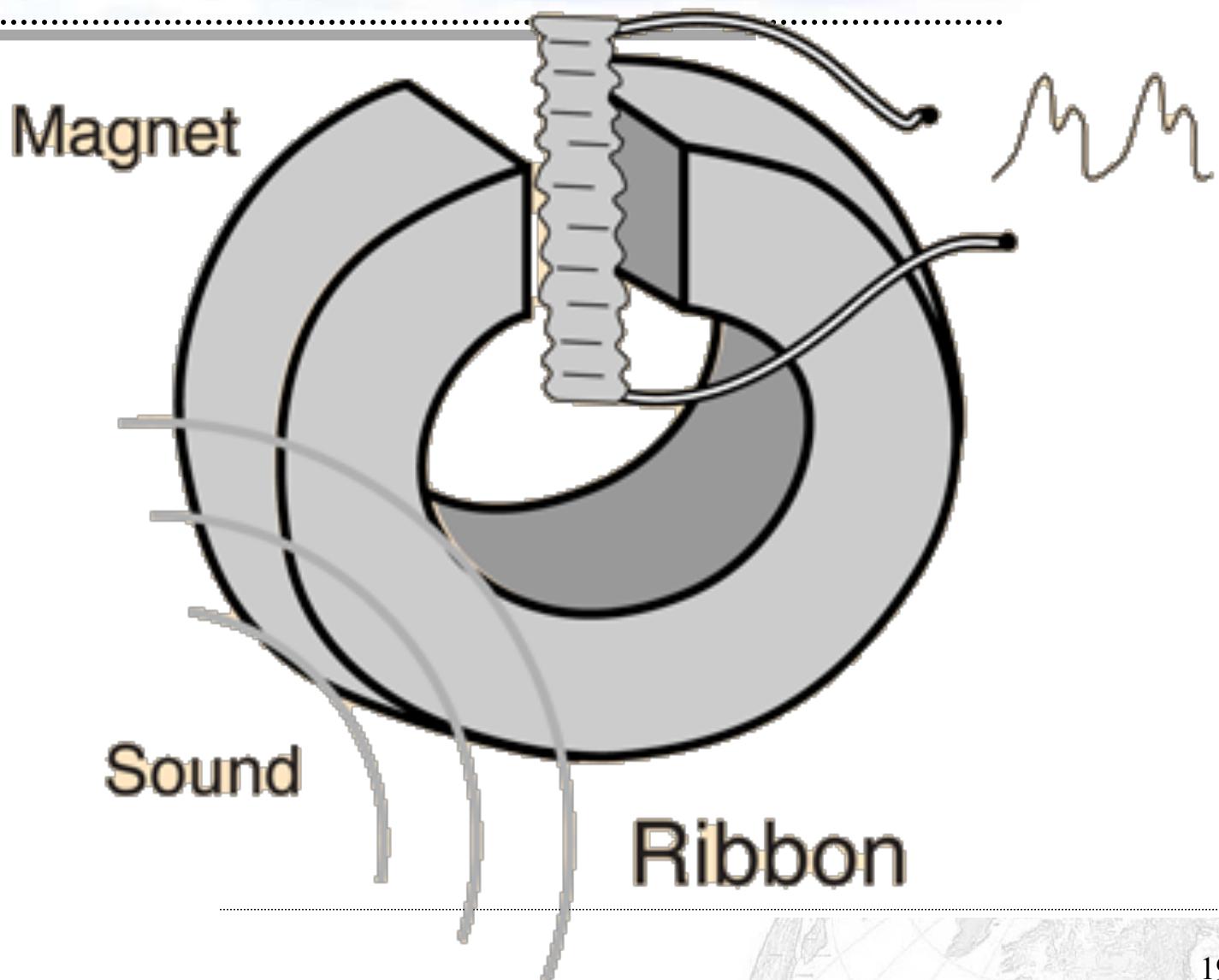
- ❖ Ability to capture high-frequency details than moving coil types.
- ❖ Has excellent noise-cancellation properties.
- ❖ Ideal for commentary situations.
- ❖ Eliminates low frequency ambient noise & noise due to proximity effect.

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# RIBBON MIC



# PICKUP PATTERN

- ❖ The Polar pattern of a microphone is the sensitivity to sound relative to the direction or angle from which the sound arrives, or easier worded how well the mic “hears” sound from different directions.

# PICKUP PATTERN

- ❖ Omnidirectional
- ❖ Bidirectional
- ❖ Unidirectional
- ✓ Cardioid
- ✓ Super Cardioid
- ✓ Hyper Cardioid



# OMNIDIRECTIONAL

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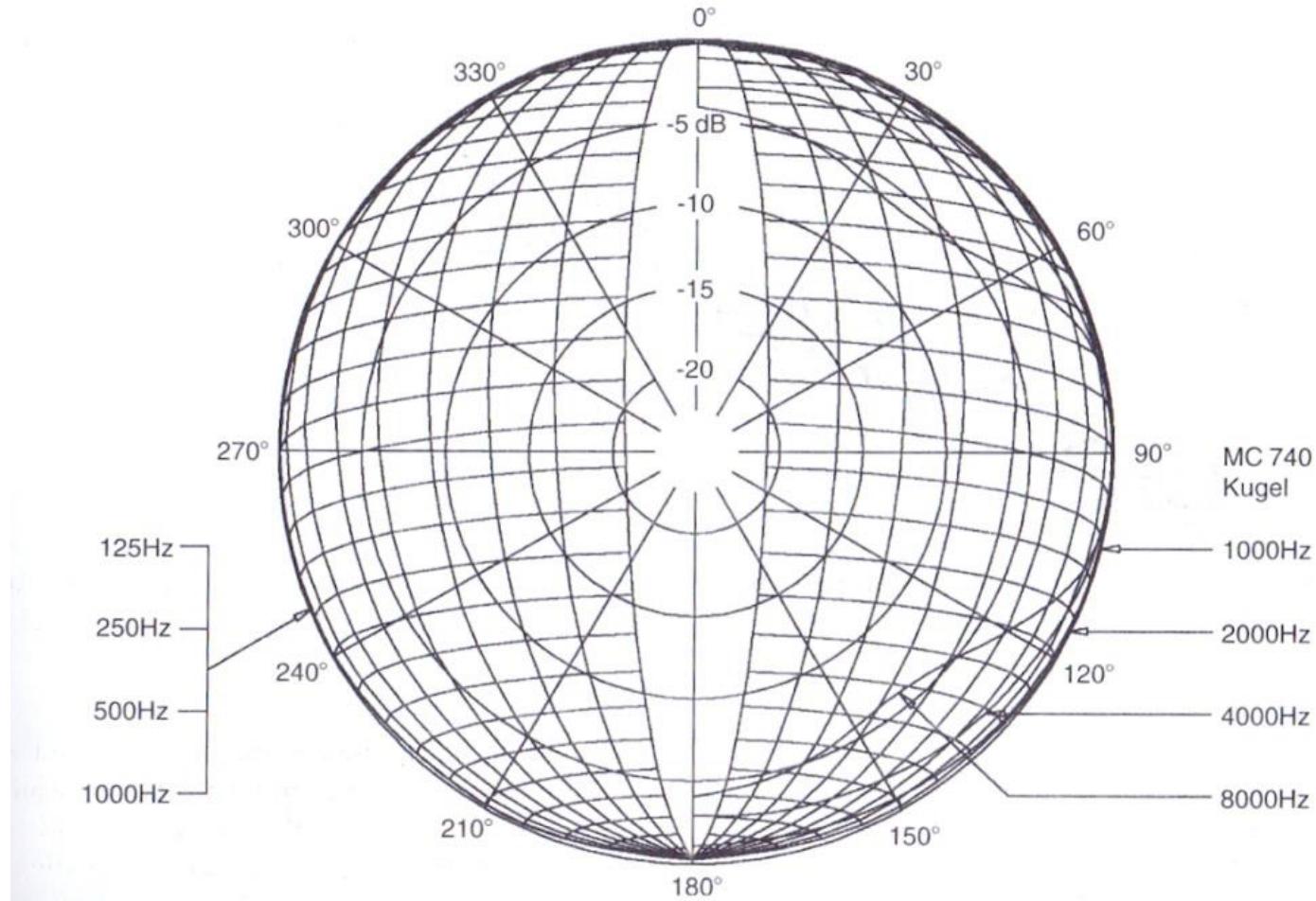
- ❖ A microphone that picks up sound equally well from all directions.
- ❖ Used whenever it is desirable to pick up sound evenly from all sides of the mic.



# OMNIDIRECTIONAL

- ❖ Used outside the studio when the ambience of the location needs to be picked up along with the presenter voice.
- ❖ Most appropriate for conducting an interview on the sidelines at a football game.
- ❖ Should be placed close to the sound source to pick up a useable balance between direct sound & ambient sound.
- ❖ Cannot be aimed away from undesired sources such as PA speakers which may cause feedback.

# OMNIDIRECTIONAL

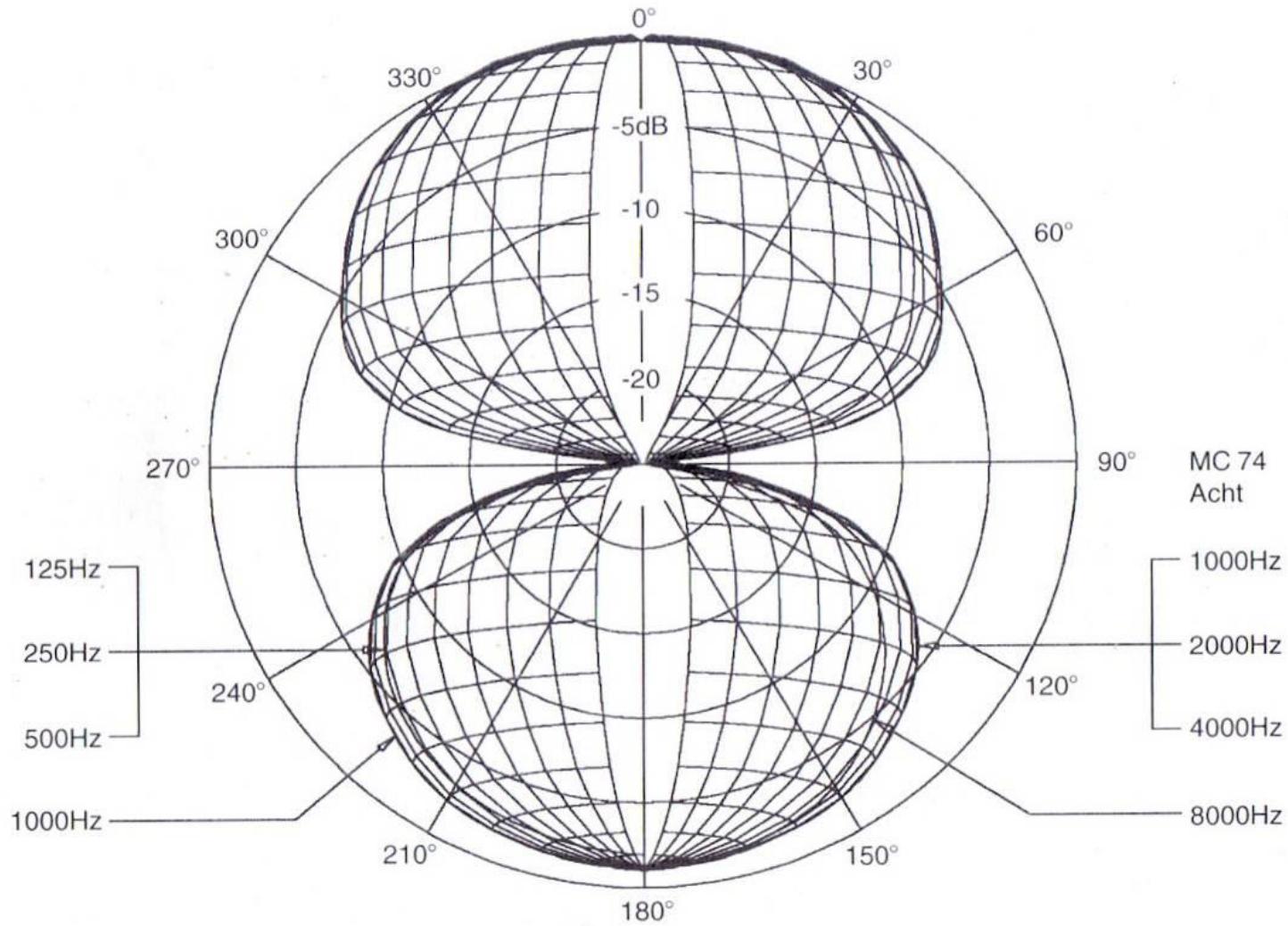


# BIDIRECTIONAL MICROPHONE

- ❖ A microphone that picks up equally from two opposite directions.
- ❖ Maximum sensitivity at both 0 degrees and 180 degrees.
- ❖ Used for picking up two opposing sound sources.
- ❖ Used for the basic two person interview.



# BIDIRECTIONAL MICROPHONE



# UNIDIRECTIONAL MICROPHONE

- ❖ CARDIOID
- ✓ Unidirectional mic hears better in one direction.
- ✓ The polar patterns of unidirectional mic are roughly heart-shaped, they are called cardioid.
- ✓ Maximum sensitivity at both 0 degrees.



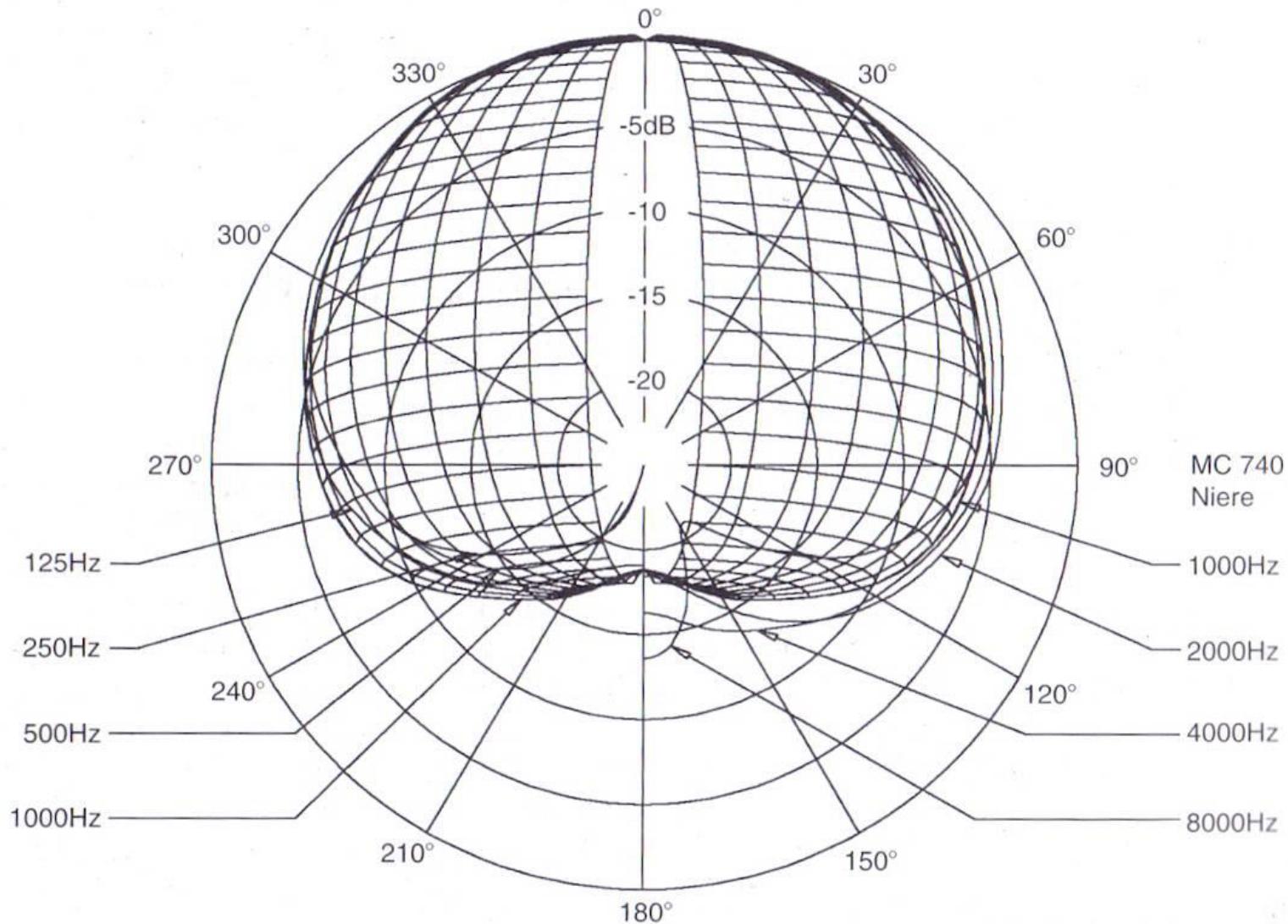
# UNIDIRECTIONAL MICROPHONE

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## ❖ CARDIOID

- ✓ least sensitive at the rear 180 degrees.
- ✓ Effective coverage or pickup angle :about 130 degrees.
- ✓ Picks up about one-third as much ambient sound as an omni.

# CARDIOID MICROPHONE



# UNIDIRECTIONAL MICROPHONE

- ❖ SUPER / HYPER CARDIOID
- ✓ Maximum sensitivity at both 0 degrees.
- ✓ Effective coverage or pickup angle: about 115/105 degrees.
- ✓ Greater rejection of ambient sound than cardioid mics.
- ✓ Picks up sound directly from the rear : the rear lobe

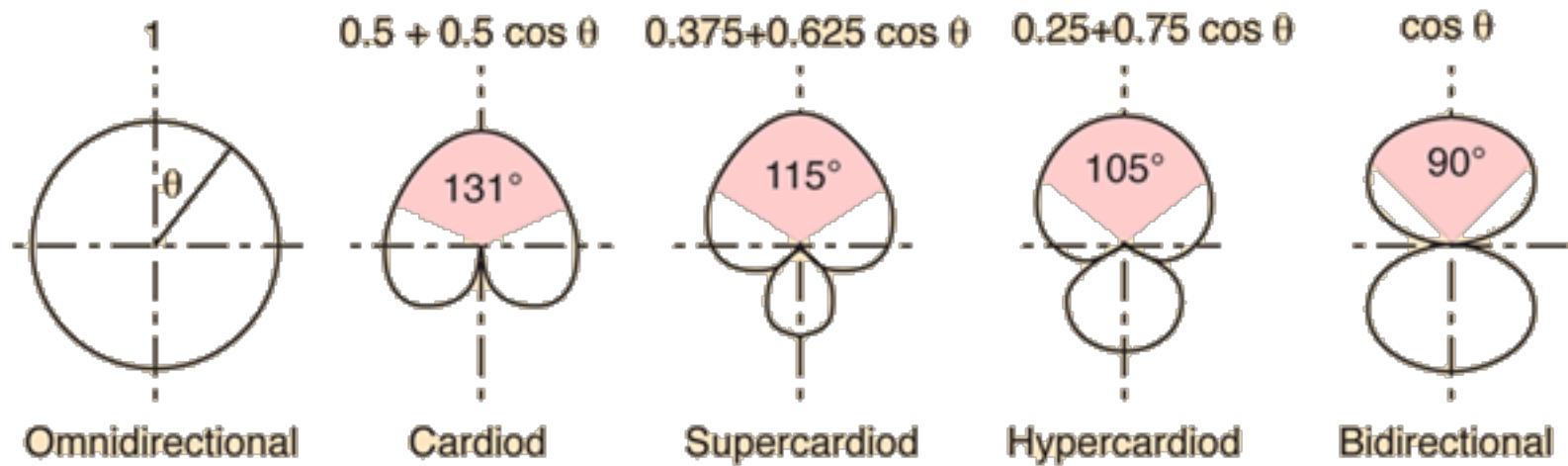


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# UNIDIRECTIONAL MICROPHONES



# GUN MIC

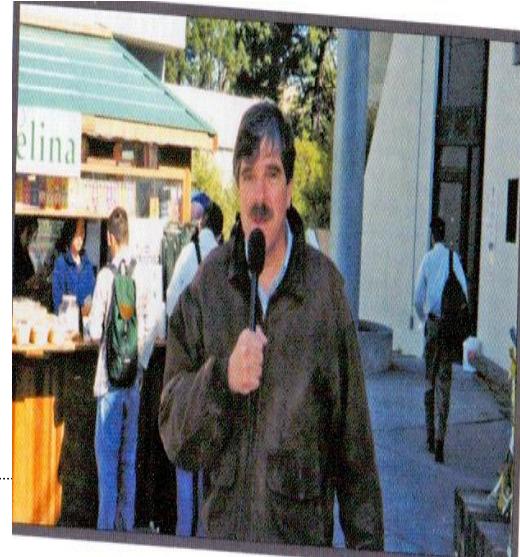
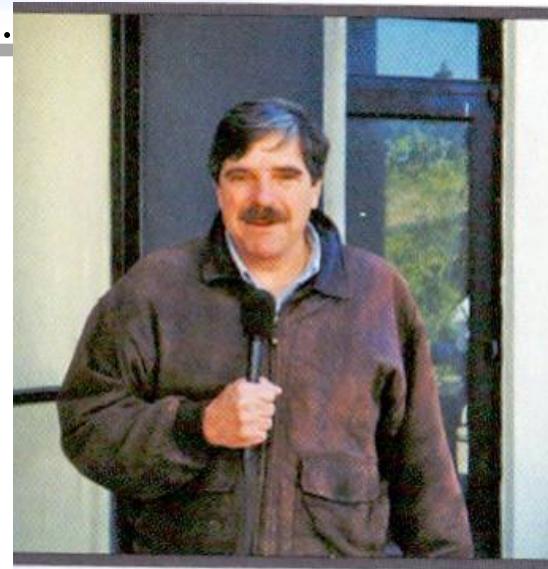
- ❖ Useful for recording more distant sounds, e.g. a voice on a stage or the speaker at a press conference, football to pick sound of the ball.
- ❖ Your gun mic should come with a grip or stand



# Where to position your Mic

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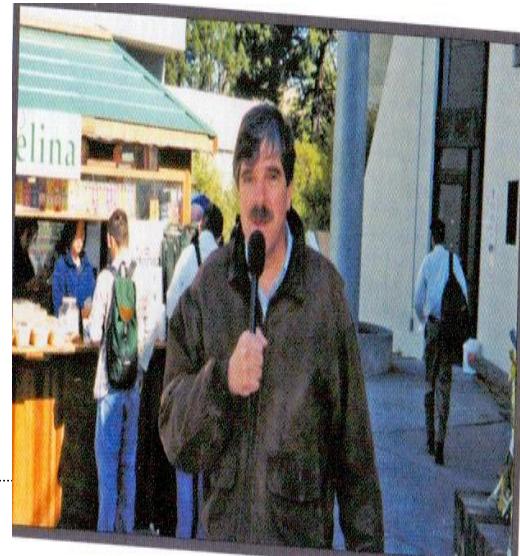
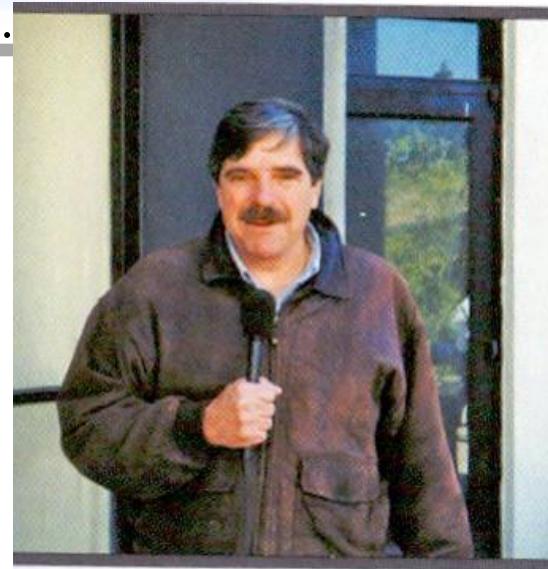
- ❖ When in a fairly quiet environment, the hand mic should be held chest high, parallel to the body.
- ❖ In a noisy environment, the hand mic must be held closer to the mouth



# Where to position your Mic

NFL

- ❖ You can of course, record your interview sitting, standing or walking. You always want to get as close as you can to your interviewee, without imposing on their space. It is better to sit or stand slightly to one side rather than directly opposite.



# Where to position your Mic

NFL

- ❖ When interviewing a child, bend down to the child's eye level.



# What type of Mic should you use?

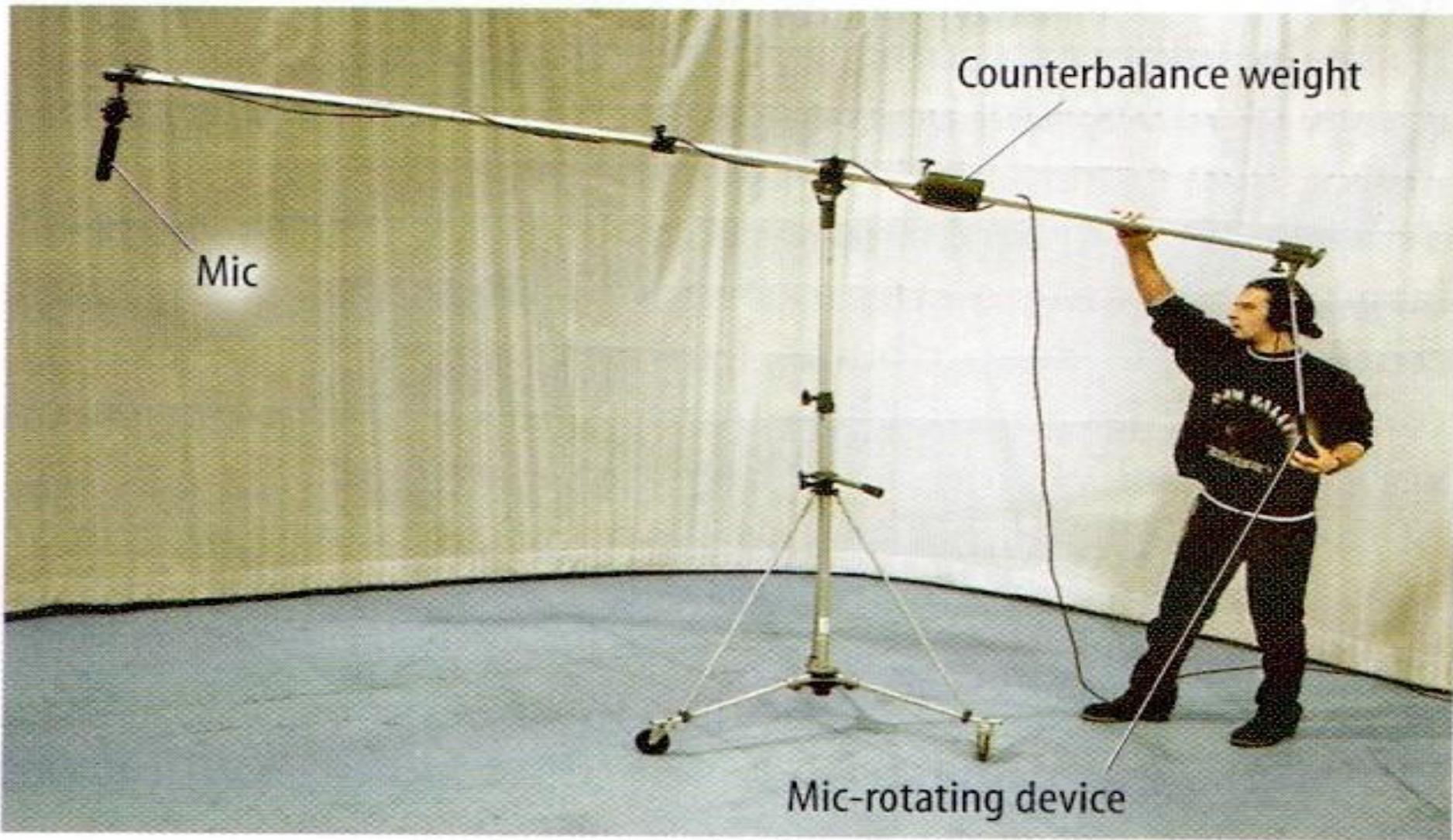
NJ

- ❖ There is no one correct mic to use in Television production work, but specific types of mics will work better than others in certain situations.
- ❖ A microphone that is perfect for voice-over work in the studio may not work well for recording a sound effect in the field.
- ❖ An understanding of how the mic hear sound will aid in the proper selection of a mic for a given situation.
- ❖ If you are trying to pick up a loud or close-up sound, a mic with a lower sensitivity rating would be desirable.

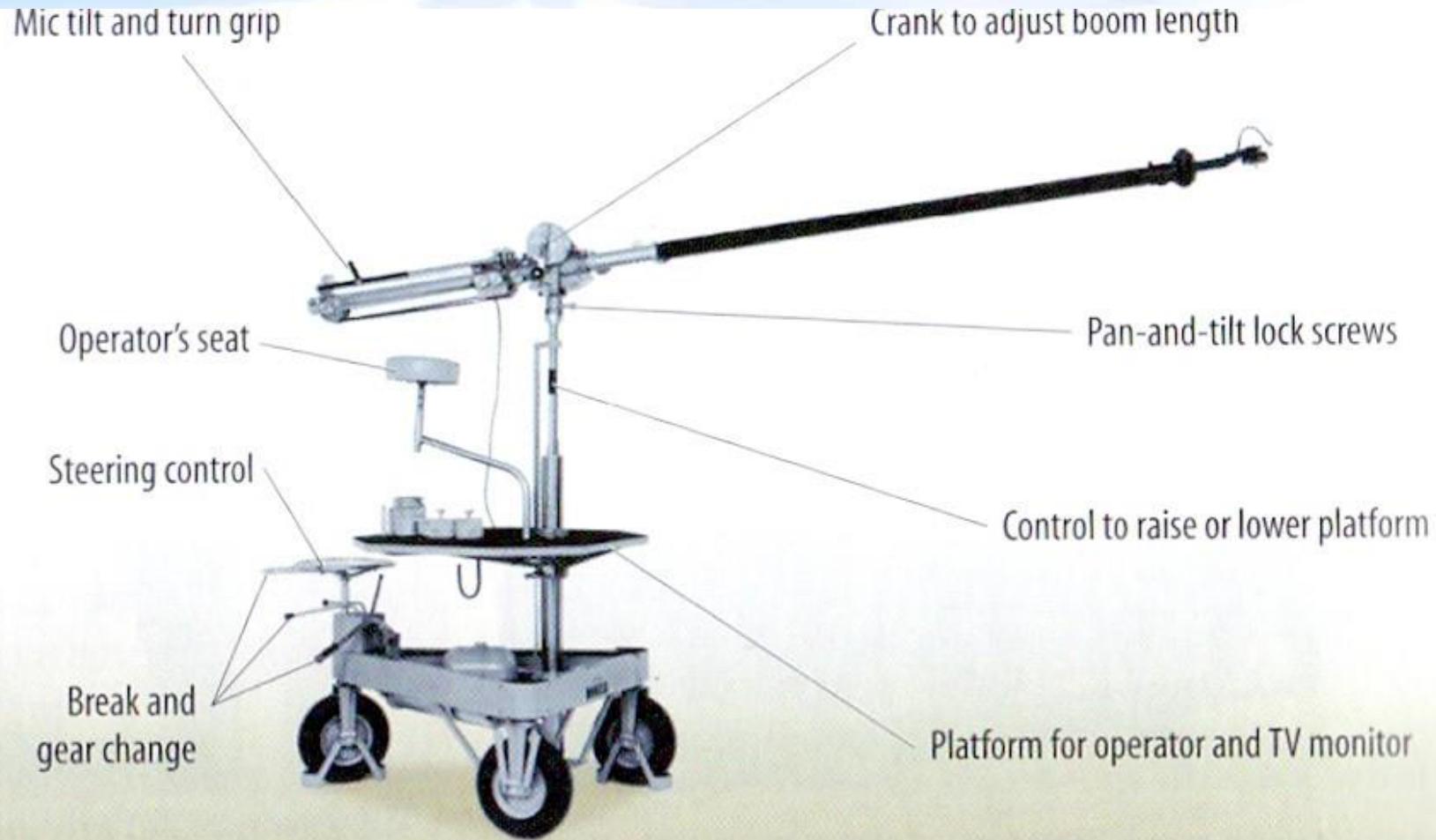
# SHORT FISHPOLE BOOM



# TRIPOD BOOM



# TRIPOD BOOM



# HOW TO HOLD YOUR MIC

- ❖ Hold the mic firmly but comfortably, and well away from the connection at the bottom
- ❖ If you're recording a lengthy interview, you may want to rest your mic-holding arm on a chair or table.



# HOW TO HOLD YOUR MIC

- ❖ Support the lead so that it doesn't sway or knock against chairs, tables, yourself etc.
- ❖ If you're using a clip mic on an interviewee, check the mic position isn't recording rustle from clothing.



# How to hold your mic : DON'T

- ❖ Let rings or bracelets knock against the mic or the lead.
- ❖ Twizzle the mic in your hand as you use it - this will cause mic bumps.



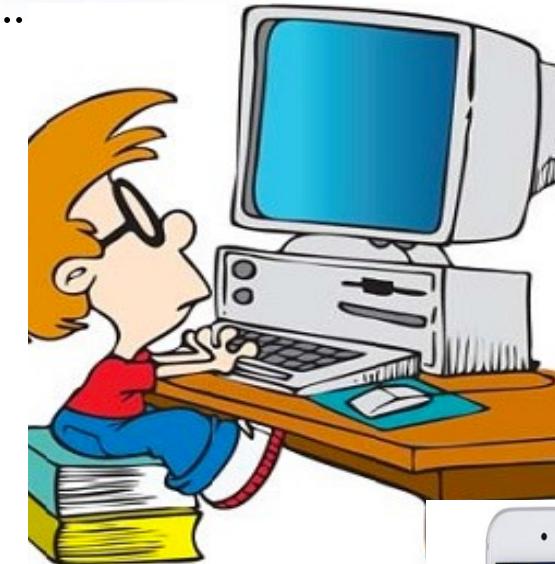
# How to hold your mic : DON'T

- ❖ Grip the mic too hard
  - your hand will go numb and may start shaking. If your arm does start to feel tired (and it will), simply ask the interviewee to pause for a moment, and swap to the other arm/hand.



# Hearing what your mic will hear

- ❖ Computers, mobile phones and fluorescent lighting may cause RF (radio frequency) interference. This will give you an unwanted buzzing, clicking or humming sound.



# Hearing what your mic will hear

## ❖ If you're inside, listen for .....

the noises of air conditioning, clocks, the hum of electrical equipment, distant toilets, music or traffic, lifts, etc.

These can cause you editing problems later on. Ask if electrical equipment can be switched off or clocks moved - but don't do this yourself, just in case any accidents occur. Check you're not on a airport flight path.



# What kind of room are you in?

Large rooms (like halls, churches etc) can be very reverberant, giving you a bathroomy sound to your interview.

You can cut down on this boomy sound by holding the mic closer to your interviewee's mouth. (But beware of 'popping'.) You could also try to find a smaller room - even a cupboard may give you a better sound

# What kind of room are you in?

- ❖ If you have to do your interview in a large reverberant room or hall, don't do your interview near the centre of the room.
- ❖ Try to move to the side but not a corner (which would give you a boxy sound).
- ❖ Don't stand too close to the wall, or you'll pick up too much reflected sound.
- ❖ Closing the curtains (if there are any) will cut down the reverberation in a large room.



# What kind of room are you in?

- ❖ If you're outside, find a sheltered location if possible to protect the mic from wind noise. Rain will make a noise if it hits the mic. (In fact, water and any technical equipment don't get on together.) If you're near traffic, choose a side street rather than a main road. A car makes a useful temporary studio if the weather or traffic noise is awful.

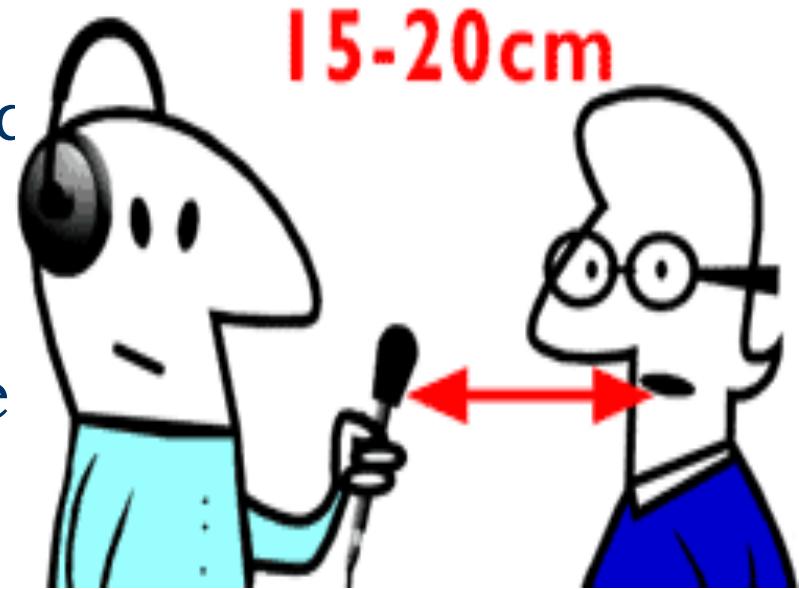


# Where to position your mic

- ❖ Exactly where to place your mic depends on what kind of mic you're using - but here are some general rules:
- ❖ In a quiet location and using an omni mic, hold the mic about 6-8 inches/ 15 -20 cm from the voice (yours or your interviewee's). If you want use your voice and your interviewee's, they need to be the same level.
- ❖ Do not talk directly into any mic, if you do, it will not only pick up excessive breath noise but also cause sibilance
- ❖ Talk into the mic from a very short distance will boost the bass range & your voice will sound warm. This also reduce leakage.

# Where to position your mic

- ❖ In a quiet location - find the midway point between you and your interviewee and hold mic there (or slightly nearer the quieter voice)
- ❖ In a noisy location - move the mic between you and your interviewee as you take it in turns to speak, but beware of mic noises that may be caused by the movement of the mic and the lead.



# Where to position your mic

- ❖ You can, of course, record your interview sitting, standing or walking. You always want to get as close as you can to your interviewee, without imposing on their space. It's better to sit or stand slightly to one side rather than directly opposite, which can feel confrontational.

# Microphone Feedback

- ❖ Feedback is a “howling” signal generated when a sound picked up by a microphone is amplified, produced through a speaker, picked up again, amplified again, and so on.
- ❖ To counteract feedback tendencies, some mic has a cardioid /hyper cardioid convertible polar response.

# Avoiding ‘popping’ and other mouth noises:

NTA

- ❖ If you hold the mic too close to some interviewees, you’ll get a nasty ‘popping’ sound caused by the blast of air on plosive syllables (b/p) hitting the mic.
- ❖ The nervous interviewee may have a dry mouth which makes clicking or smacking noises when they speak. Give them a drink of water

# Avoiding ‘popping’ and other **NF** mouth noises:

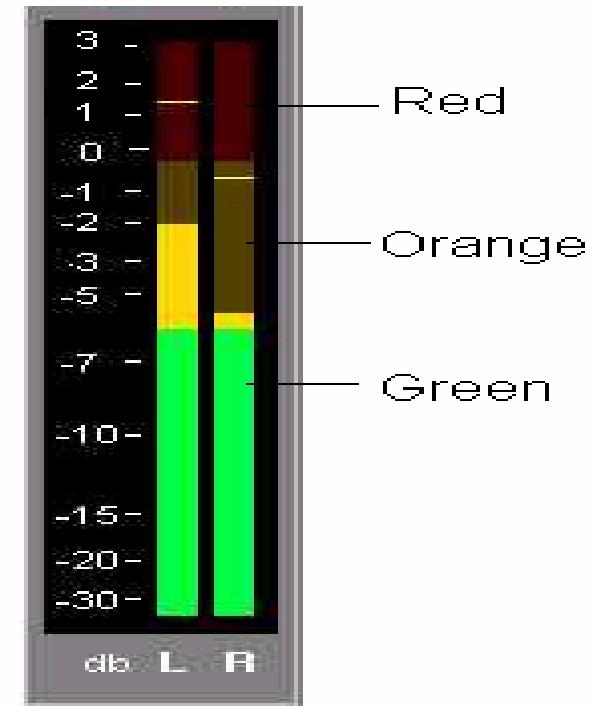
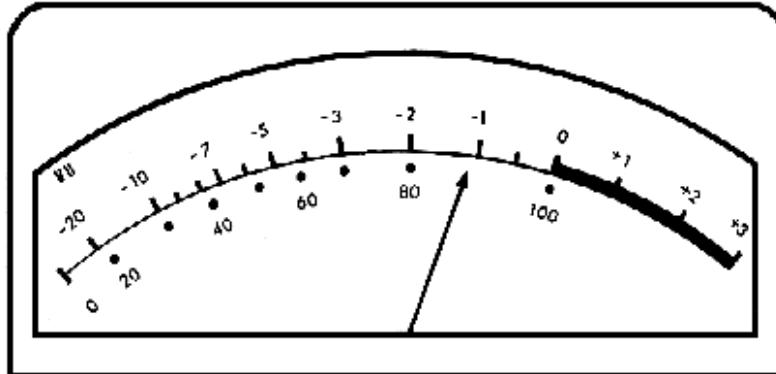
- ❖ Always wearing cans so that you’ll hear it when it occurs
- ❖ Angling the mic to one side of the popping person’s mouth.



# Mic positions and controlling levels

- ❖ Often you'll need to do more than simply set levels and let the recording run.

Here are some common problems and their solutions...



# Mic positions and controlling levels

## ❖ Problem 1:

Recording an interview in a noisy environment (e.g. busy street, sports event, press conference) and trying to get a good level on the speaker/interviewee above the background noise.

## ❖ Solution 1:

Position the mic closer than usual, but be very careful to avoid popping. Set your level with the mic in this position.



# Mic positions and controlling levels

## ❖ Problem 2:

Recording both a quiet and loud voice - and getting the balance of levels right

## ❖ Solution 2:

So that you're not constantly fiddling with the levels, set your level against one of the voices and then position the mic so that it is nearer to the quiet voice and further away from the loud voice

# Microphone Care

- ❖ Beginning announcers often misuse a microphone by blowing into it to see if it's live or to set a level. This is the worst way to test a mic and can result in serious damage to the mic.
- ❖ The best way to set a mic level is to read several sentences of your script or you say "Testing 1, 2,... 9, 10
- ❖ Protect mic from dirt & damage by storing & transporting them in their original packages or in a specialized mic case.
- ❖ Avoid mic falling or mechanical vibration.
- ❖ Remove & wash the windscreen in a soap solution.



# Microphone Care

- ❖ Mic easily damaged by excessive sound, pressure exposure, physical shocks.
- ❖ Dirt, dust, moisture can degrade mic performance dramatically.
- ❖ Accessories like windscreens & desiccants will help keep moisture off the mic.
- ❖ The most expensive mic , the most fragile.
- ❖ Store mics in their protective cases when not in use.



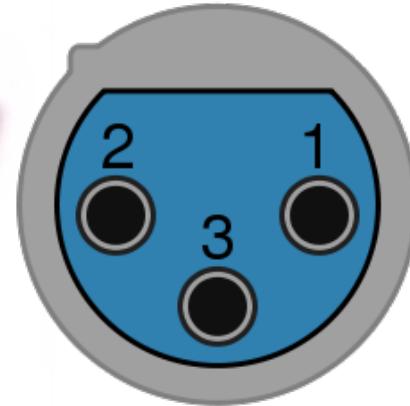
# TALK STUDIO



# XLR CONNECTORS



Female



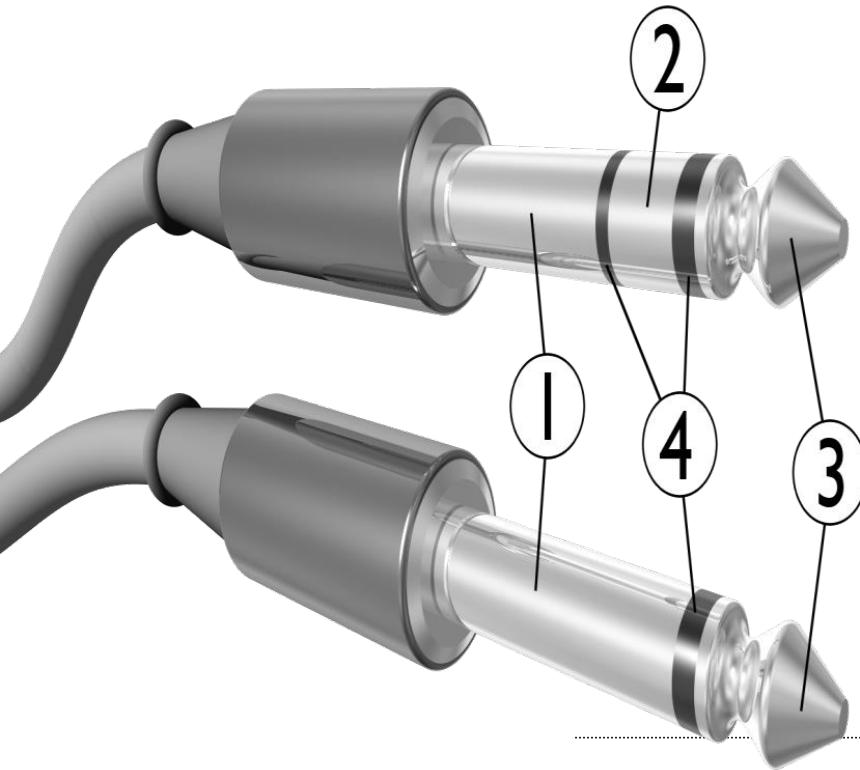
Male



# RCA CONNECTORS

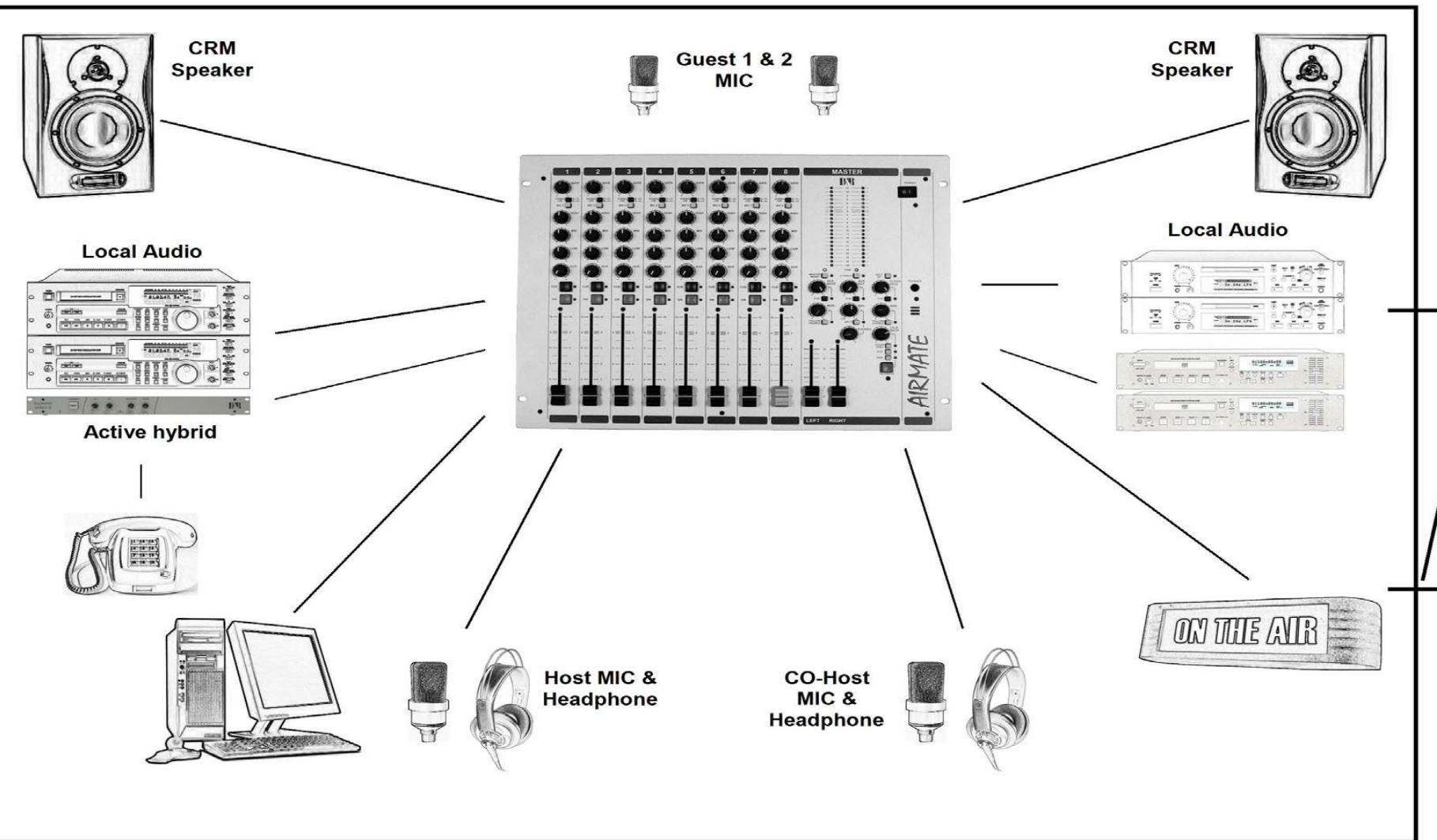


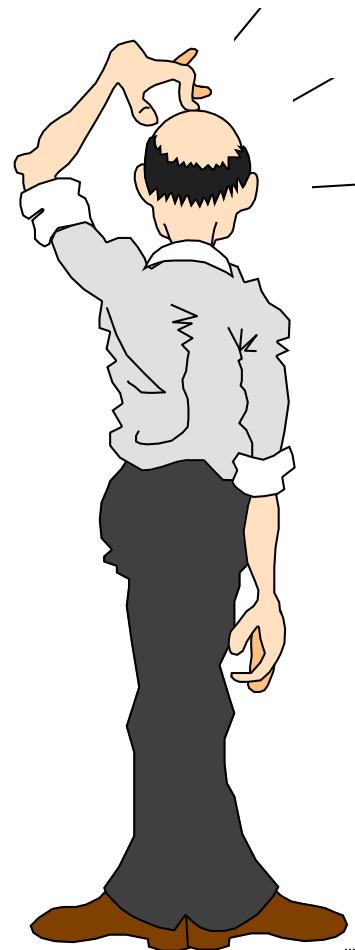
# PHONE (JACK) PLUGS



# MCR LAYOUT

Control room solution with D&R AirMate





# Questions??



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Thank  
You!

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