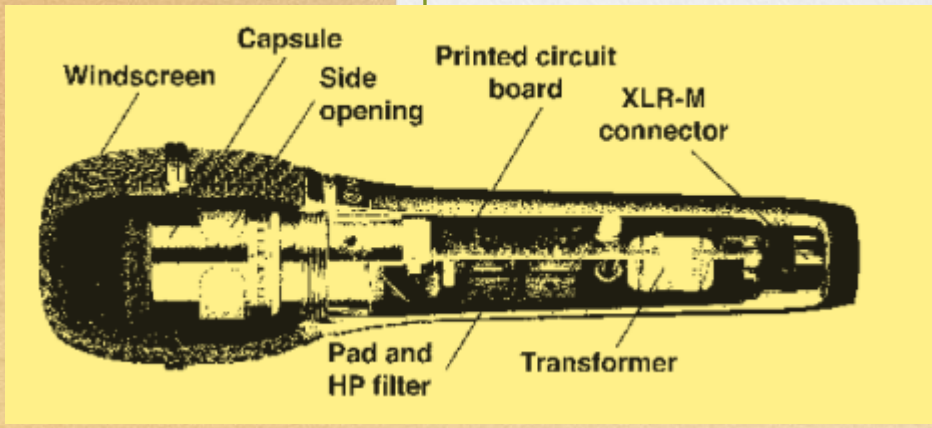
Microphone

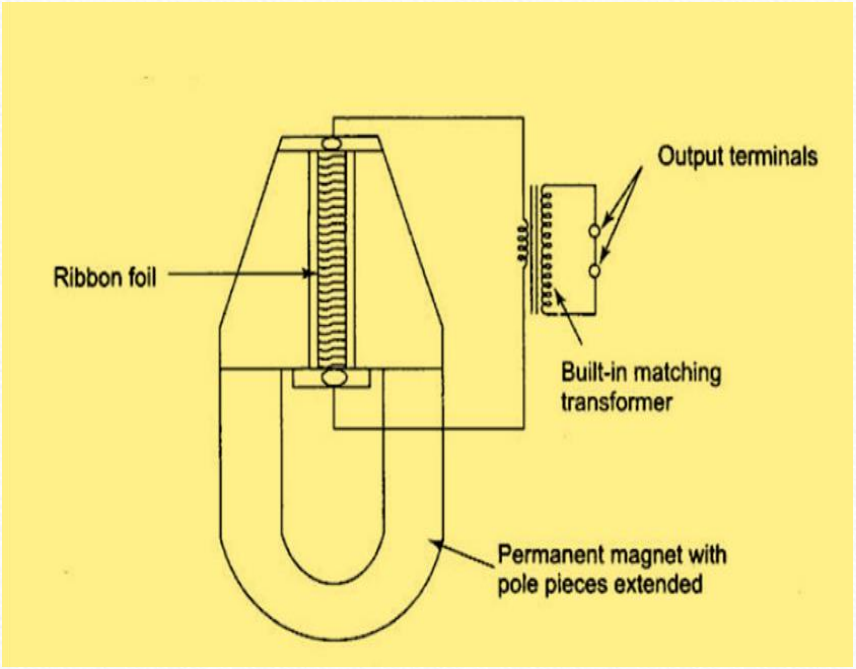
Diagram

Construction

Working, characteristics



Ribbon



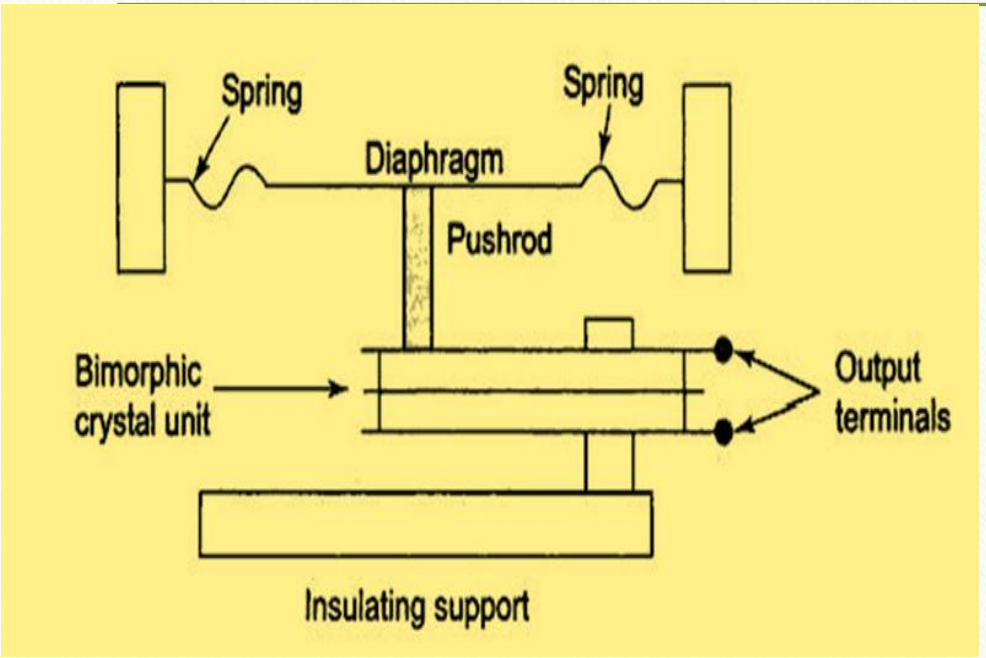
Construction /Consists of two part
Ribbon foil (aluminum wire)
permanent magnet (generate strong magnetic field)

- working –when sound wave was applied on ribbon foil , magnetic flux changes ,so emf (v),induced across ribbon foil,
- i.e output voltage proportional to
- 1 induced voltage – proportional to rate of change flux.
- 2. no of turns of coil
- 3. force of sound wave string the ribbon

Characteristic of ribbon

- Frequency response- 20 to 12KHz.
- directivity – figure of 8 , bidirectional
- Imp - 0.2 Ω
- sensitivity – 3uv
- Signal to noise ratio – 50db
- distortion – 1%

Crystal microphone



Construction - consists of two part

1.Diaphram – made by aluminum material

2. crystal slice (quartz, ceramic) And insulating supports

- Working – when sound wave was applied to diaphragm ,
- then crystal vibrates ,so difference of voltage induces at two electrode .
- induces voltage propositional to mechanical pressure was applied to crystal

Characteristics of a Crystal Microphone

Sensitivity The crystal microphone has good sensitivity, about 50 mV (or 26 dB below 1 volt) for 0.1 Pa pressure.

Signal-to-noise Ratio It is not prone to pick up background noise. Generation of noise inside the microphone is also low. Hence its signal-to-noise ratio is high, about 40 dB.

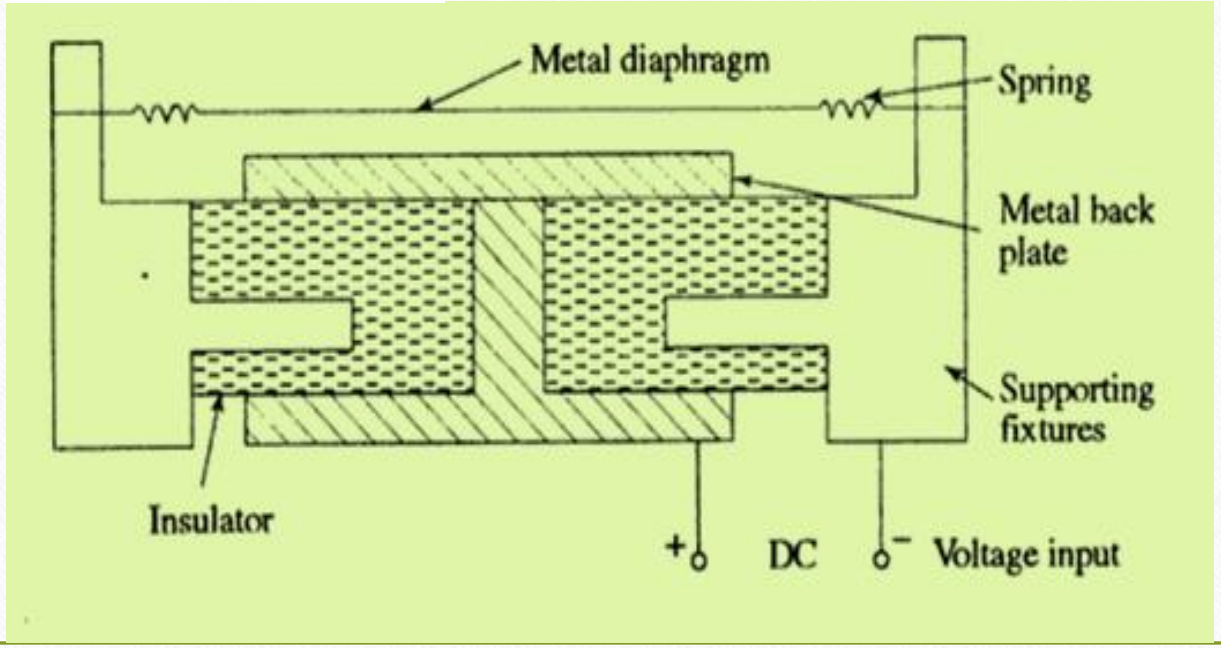
Frequency Response 100 – 8000 Hz for ±1 dB

Distortion Low, about 1%

Directivity Omnidirectional

Output Impedance High, about 1MΩ

Capacitor microphone.



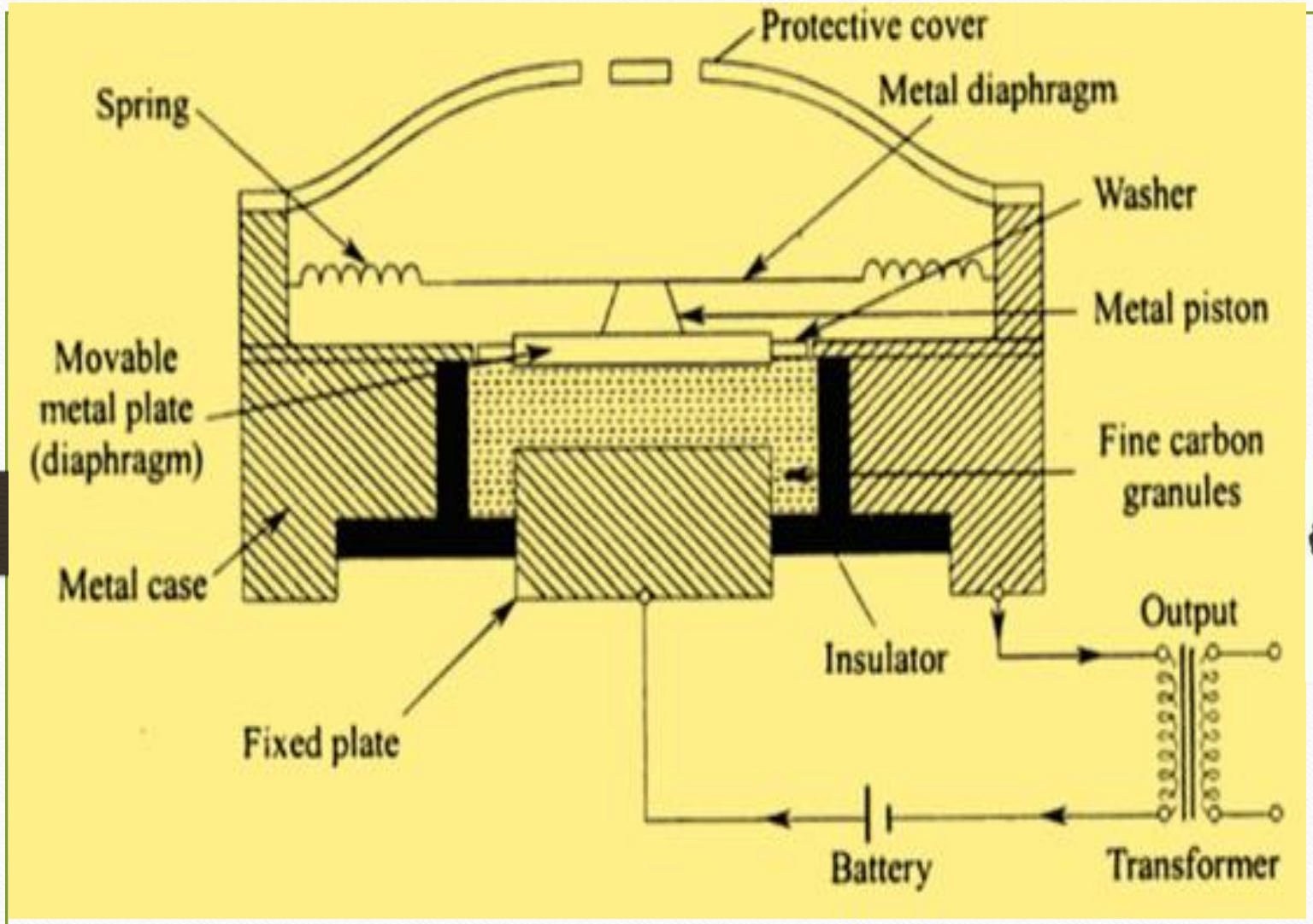
Construction – consists of two plates of capacitor . One plate is movable, where diaphragm is attach. Diaphragm made by metal second plate fix, called as back Metal plate. And for biasing Dc supply required. Insulation supports

Operation-

- when sound pressure wave is applied to diaphragm,
- distance between the plates was decrease as a result capacitance is increase , so capacitor plates across voltage decrease .
- So according to sound pressure wave (compression / rarefaction) , the distance between the plates was decrease, as a result capacitance is increase , so capacitor plates across voltage decrease. i.e change in voltage / AC o/p voltage
  - $C = \acute{\varepsilon}A/d \quad v = Q/C$
  - O/P VOLTAGE depend on distance between plates and sound pressure wave.

characteristics

- Sensitivity-low required amp.3mV
- s to n ratio – 40db
- Freq, res.---40Hz to 15KHz
- distortion – 1%
- directivity – omnidirectional
- o/p imp – 100M Ω



Construction- consists two metal plates ,in between plates carbon garnules are placed.

1 one plate is attach to diaphragm and second plate fix. For protection Unite was cover with holes

Output is taken from transformer

Carbon microphone

- Operation –when sound wave applied through diaphragm , carbon granules resistances decreases ,so at o/p current was increase
- When sound was applied, diaphragm moves Forward so resistances of garnules decrease so o/p current increase in the circuit.
- o/p voltage proportional to resistance of granules

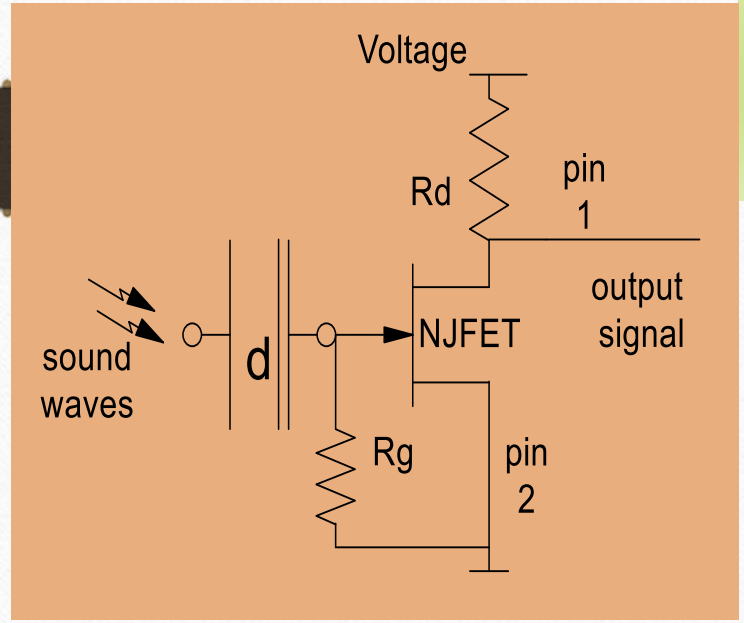
characteristics

- Sensitivity- very high 20db / below 1v
- s to n ratio – low due to random change in resistance of granules so hiss noise was present .
- Frequency response – 200 to 5khz so it can be use in Telephone.
- Distortion – 10% high due internal resistance
- Directivity – omnidirectional
- Output imp- 100 ohams.

Electret microphone.

- It is a type of electrostatic capacitor-based microphone
- construction An electret is dielectric material
- that place between a two plates of capacitor, diaphragm act
- As one plate of capacitor where sound wave was applied ,with this ,variable capacitance is used to generate the recorded electrical signal .
- Sound wave converted into electrical signal

working



sound wave is applied to one plate of capacitor , distance between plate changes so capacitance changes so o/p voltage is generated

$C = \acute{\varepsilon}A/d \quad v = Q/C$

O/P VOLTAGE depend on distance between plates and sound pressure wave.

- communication and recording in devices including telephones, smartphones, desktop computers, tablets, headsets, high-performance recording systems, hearing aids, megaphones and more
- Characteristics
- poor high frequency response (5 kHz)
- o/p imp – 50 MΩ
- Directivity – omnidirectional
- Distortion - low

Pin Identification and Configuration:

No:	Pin Name	Identification	Description
1	Output terminal	Surrounded by black layer	This is the Output pin of the microphone.
2	Ground Terminal	A small connection (silver line) can be found between the terminal and casing	This is the ground pin of the microphone

Tie clip microphone

is a small electret or dynamic **microphone** used for television, theatre, and public speaking applications , filming interviews

- They are most commonly provided with small **clips** for attaching to collars, **ties**, or other clothing
- is *small size and lightness.*
- *Improve audio on footage*

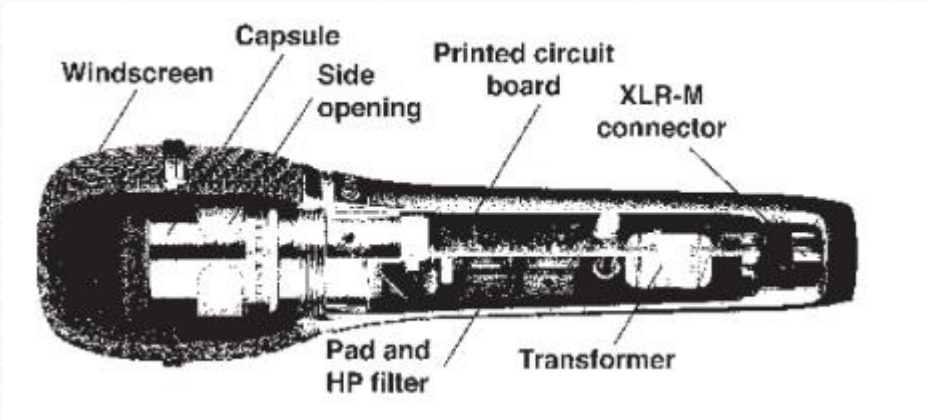
- They are "omnidirectional", so they pick up sound from every direction
- Operation – you plug it on mic jack of Camcorder for sound signal recording in classroom , interview .

Tx unit

Rx unite other side

	Riboon	Crystal	capacitor	carbon
sensitivity	3micro v	15mv	3mv	100mv
Frequency res	20 -12KHz	100-8KHz	40- 15KHz	200-5KHz
Distortion	1%	1%	1%	105
directivity	Fig. 8	Omni dire.	Omni dire.	Omni dire.
o/p imp	0.25 Ω	1MΩ	100MΩ	100Ω
size	big	small	big	small
Cost	high	low	high	low
Application	Drama music	Home recording unit	Studio recording	telephone

Thank u


Windscreen
Capsule
Side opening
Printed circuit board
XLR-M connector
Pad and HP filter
Transformer