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Use of Microphones in Music

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Abstract:-

In today's modern world science can be related to many other subjects including music. In the field of music, there are various new modulations acquired nowadays should be into consideration we use various types of microphones during different music programmes but we don't understand nature of importance while working with it. In this article it will be try to describe particular types of mic and how to use microphones in music.

Introduction:-

A Microphone is a transducer which converts acoustic sound energy into electrical energy. The sensitive transducer element of microphone is called its element or capsules. The single needs a pre-amp to convert it to a workable level/impedance. A polar response is used to determine how the audio is captured. Microphones are very important specially as a technique of pick up a natural tonal balance, techniques to help reject unwanted sounds and even techniques to create special effect.

The history and development of the microphone, it is essential first to take into consideration the brief history of microphone.

1827: - Sir Charles Wheatstone was the first person coin the phrase "microphone". He was an English scientist and inventor during the Victorian era. The device was simple instrument for augmenting sounds, it consisted of two slender rods, which conveyed the mechanical vibrations to both eras and is quite different from the electrical microphone of Professor Hughes.

1876: - Emile Berliner invented the first microphone used as telephone transmitter. The Bell company later bought Berliner's microphone patent for \$50,000 to improve their own telephone device.

1878: - The carbon microphone was invented by David Edward Hughes. Hughes carbon microphone proms the basis to many of the microphones still in use today. **1916:-** The Condenser microphone invented at Bell Labs by E.C. Wente and can also be referred to as a capacitor or an electrostatic microphone. **Mid 1920s:-** The invention of the Electronic vacuum tube amplifier gave greater volume output for devices including the microphone.

Late 1920s:- The omni directional dynamic microphone was developed by Wente and Thuras and called "The Western Electric 618A".

1942: - The Ribbon microphone was invented for the new format of radio broadcasting the most popular were the 44_{BX} and the 77_{BX} developed by Harry Olson at RCA. The first ribbon microphones were extremely fragile and needed to be handled with care to maintain their high quality sound.

The history of the microphone is a lot bigger than this brief overview and other areas that could be researched include makes and models of microphone, polar patterns types and different designs and also recording techniques using singular or multiple microphones.

Type of Microphone:-

When selecting microphones to use for a live performance or in your home studio, you'll come across four different types: **Dynamic** and **Condenser / Capacitor, Ribbon, Boundary**. Let's look at these microphone types, and what their uses. Instead of that microphones there are more type of microphone like, Wired Microphones, Handheld Wireless Microphones, Handsfree Wireless Microphones

- **Dynamic:-** Dynamic microphones are versatile and ideal for general-purpose use. They use a simple design with few moving parts. They are relatively sturdy and resilient to rough handling meaning they are better for live sound. They are also suited to handling high volume equipment such as amplifiers and other instruments. They have no internal amplifier and do not require batteries or external power.
- Doesn't need 48v of Phantom power
- Only captures sounds that are very close to the axis of the microphone
- Good for noise reduction and getting the cleanest signal at a live venue
- Shure sm58, Shure sm57, AKG D112

How a Dynamic microphone works:-

A magnet is moved near a coil of wire and an electrical current is generated in the wire. Using this electromagnet principle, the dynamic microphone uses a wire coil and magnet to create the audio signal. The diaphragm is attached to the coil. When the diaphragm vibrates in response to incoming sound waves, the coil moves backwards and forwards past the magnet. This creates a current in the coil, which is channeled from the microphone along wires.

- **Condenser / Capacitor:-** A condenser microphone is fragile and more sensitive to sound. The pickup higher pitched and more detailed sounds but cannot withstand high sounds. They are good at picking up really quiet sounds. Condenser microphones require power from a battery or external source. These microphones are best used to record a voice or an acoustic guitar.
- Needs 48v of Phantom power
- Suitable for studio recording as they are very sensitive
- The large diaphragms are very fragile
- Rode NT2, Rode NT5, AKG C1000's

How a condenser microphone works:-

A capacitor has two plates with a voltage between them. One of these plates is made of very light material and acts as the diaphragm. The diaphragm vibrates when struck by sound waves, changing the distance between the two plates and changing the capacitance. When the plates are closer together, capacitance increases and a charge current occurs. When the plates are further apart, capacitance decreases and a discharge current occurs. A voltage is required for a condenser microphone to work. This voltage is supplied by a battery or by phantom power (48volts).

Ribbon Microphone:-

A ribbon microphone is a unique type of dynamic microphone that is based around a thin, corrugated strip of metal (often aluminum) or film suspended between two magnetic poles. Unlike traditional moving-coil dynamic mics, the ribbon element responds to variations in the *velocity* of air

particles, rather than the *pressure*. As the ribbon vibrates within its magnetic field, it generates a tiny voltage that corresponds to these changes in velocity. In classic ribbon designs, this level is very low compared to typical dynamic mics, and a step-up transformer boosts both the output voltage and impedance. Preamp choice is very important when using ribbon mics.

Because a ribbon mic has an extremely thin, delicate element, it is capable of capturing fast transients. Ribbons mics have a wide dynamic range, and are capable of handling high SPLs at high frequencies. (Give them a try on brass or percussion.) These mics are bidirectional by design, because the ribbon element responds to sound arriving from the front or back of the mic, and does not pick up sound arriving on its sides. This natural figure-8 pattern makes them ideal for stereo recording applications, and is useful in applications where you want to eliminate unwanted noise between two sources (i.e. in broadcast).

Conclusion:-

Research method from books and informations from various websites on internet. Second important things are discussion with renowned performing artists. So I think Firstly choose a mic that your sound and style b'cos if the mic doesn't fit the personality of your voice you can unconsciously tense up throat muscles in an attempt to compensate for the electronic alteration. Second thing is actually audience wants to understand what you are singing if you move your head away as you tamper the volume at the end of your phrase your voice will drop out of the mix. Keep your mouth directed to the mic through the end phrase you sing. And third is how to work with the proximity effect in short mic respond differently depending upon how close or far they are from your mouth when singing loudly or softly.

Actually it is true that the success of a performance specially the vocal performance is the combination of many aspects like musical talent good knowledge, a gifted and trained voice and finally the techniques related to microphone and presentation.

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