



STUDY OF ADVANCED MUSIC RECORDING TECHNOLOGY PREVALENT IN INDIA

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Abstract:

Modernization is a common term heard in the present day, which has been affecting practically all fields. Music industry has likewise been exceptionally affected by the growth of technology. Technology has affected practically all branches of music, for example, teaching, learning, stage performance, concert pattern, preservation, propagation and numerous others. Karnataka music is a form of music which has consistently been alluded to as a framework profoundly established in traditionalism. Toward the starting the conventional minds were reluctant in presenting themselves to technology. Be that as it may, gradually technology prevailing with regards to affecting them and accomplished a strong base in the field of music. So in this paper we will learn about the development music recording technology predominant in our country so as to get the best possible comprehension of music recording.

Keywords: *Modernization, music, instruments, sound, recording, etc.*

1. INTRODUCTION

The present current and globalized world has thrown open new avenues for preservation and propagation of music. There is additionally a growing demand for helpful openness of information everywhere throughout the globe. This has brought about another technology called sound recording. This technology enables us to safeguard any form of audio for ages. Probably the best commitment in this field is by Thomas Alva Edison, who found a technique for recording and playing back sound. It changed the world. Sound recording is an electrical or mechanical engraving and re-making of sound waves. Sound waves might be of any form. It might be spoken voice, singing, instrumental music or other sound impacts. There are two primary kinds of sound recording technology. One is analog recording and the other is digital recording. In acoustic analog recording a little microphone diaphragm is utilized. This microphone

diaphragm recognizes changes in barometrical weight and the sound waves are recorded on a medium like phonograph as charts. In attractive copying, the sound waves vibrate the microphone diaphragm and are changed over into a differing electric current, which is then changed over to a shifting attractive field by an electromagnet, which makes a

representation of the sound as magnetized territories on a plastic tape with an attractive covering on it. Analog sound reproduction is the turnaround procedure, with a greater amplifier diaphragm making changes climatic strain to form acoustic sound waves.

Electronically created sound waves may likewise be recorded straightforwardly from gadgets, for example, an electric guitar pickup or a synthesizer, without the utilization of acoustics in the recording procedure other than the criticism for musicians to tune in and judge



how they are playing during recording sessions. Digital recording and reproduction changes over the analog sound sign got by the microphone to a digital form by a procedure of digitization, enabling it to be put away and transmitted by a more extensive assortment of media, digital recordings are viewed as of a higher caliber than analog recordings. This is on the grounds that, the noise and electromagnetic interface found in analog recording are kept away from in digital recordings, which can give a noise free output. A digital audio sign must be reconverted to analog form during playback before it is applied to an amplifier or earphones.

2. OBJECTIVES

- i. To get the proper understanding of various music technology.
- ii. To get the proper knowledge of development in various technologies of music recording.

3. HISTORY AND GROWTH:

The evolution of the sound recording technology is extremely fascinating and furthermore complex. The evolution is to a great extent directed by the various necessities of that particular time and furthermore the curiosity of human mind towards perpetual quality and everlasting status. It was an inclination to make the fleeting sound lasting. The evolution of sound recording technology is normally characterized into four times:

- a) **The mechanical time:** This period returns nearly to ninth century. The fundamental devices for duplicating sound were mechanical in nature and were not able record arbitrary sounds, for example, the human voice. The earliest known programmed reproduction of music was maybe in ninth century. It is

credited to the time of Abbasid Caliphate in Bagdad. Three Arab brothers prevalently known as Banū Mūsā brothers drew out a huge illustrated deal with mechanical devices. It was titled The Book of Ingenious Devices. The book talks around one hundred devices and furthermore the strategy to utilize them. It is said that these Banu Musa siblings invented most likely 'the earliest known mechanical musical instrument.' It was an organ played by hydropower utilizing the exchangeable cylinders consequently. These siblings additionally delivered programmed woodwind player. It is said that they submitted the general direction to Apollonius. "Apollonius had just built up a pressure driven pneumatic system of such complexity that his human figure could play the flute interminably—insofar as gave a steady constant of water.

- b) **The acoustic era:** In the acoustical recordings, the sound recordings were made by mechanical methods. Microphones or electrical enhancement were not utilized. phonoautograph was presumably the primary mechanical device, invented by Leon Scott in 1857. For first time this could record arbitrary sound. It utilized a film which was appended to a pen to record the sound. This traced a line generally relating to the sound's waveform onto a roll of paper. The instrument recorded the sound. Yet, it couldn't playback the recorded sound. It ended up being its significant disadvantage. Later on Thomas Alva Edison extended the rule of phonoautograph and invented the Phonograph. This was in the year 1877. Phonograph comprises of a chamber, which was secured with a susceptible



material. On this material typically 73 a tin foil, lead or wax, a stylus (needle) is utilized to engraving grooves. The profundity of the woods compares to change noticeable all around weight made by the first sound or sound to be recorded. This is an improvement over phonoautograph. This device could playback recorded music by following a needle through the score and the subsequent vibrations were enhanced through mechanical methods. Despite the fact that it is the main commercial recording instrument, it was difficult to imitate the phonograph cylinders in large scale manufacturing. All things considered it was accessible in the market. Give us a chance to have a winged animal's perspective on the utilization of phonograph in India.

- c) **The electronic era:** In 1888 Oberlin Smith an Englishman invented the concept of recording sounds magnetically. After ten years for example around 1899-1900 Valdemar Poulsen presented magnetic recording. Smith utilized "tapes" of texture which had iron filings. The device, which Poulsen conceptualized, utilized magnetized steel piano wire to record and imitates sounds. The wire, which kept running between the spools, was equipped for recording relentlessly for thirty minutes. It moved at a speed of 84 inches for every second. This proclaimed a revolution in the field of sound recording industry. The creation of the microphone, blenders and other electronic gadgets gave another go to the recording industry.
- d) **The digital era.** The creation of PC prompted the digitalization of recording. Digital recording is another milestone in the region of recording. It changes over

the analog sound sign got by the microphone to a digital form by a procedure of digitization. It has encouraged the storing and transmission of information by a more extensive assortment of media. Digital recording stores audio as a progression of twofold numbers representing tests of the adequacy of the audio signal at equal time interims, at an example rate so quick that the human ear sees the outcome as nonstop sound. ADAT and HIGH 8 were the digital multi track recorders that could record various tracks immediately onto a super VHS tape that is utilized by consumer.

4. AUDITORIUM ACOUSTICS:

The room where we listen to sounds has an important influence on what we listen. On the off chance that the Sound delivered needs to contact the group of spectators in a clear way, the room must be acoustically structured. The reverberation and reverberation spoils the sound quality of a lobby on the off chance that it is without acoustic treatment. Utilizing different acoustic measurement virtual products reverberation time, deferral and reverberation can be calculated. Contingent upon the corridor quality, acoustic material can be picked and can be acoustically treated. PA system flying system or else postpone speakers will be fundamental for the bigger assembly halls.

The physics of propagation of sound is an exceptionally convoluted procedure. At the point when the assortment of materials that make up the walls, floors and ceiling are added to the equation, it turns out to be substantially more difficult to anticipate the idea of sound waves. Each room is extraordinary and it's not simply the measurements that will dictate how the room will transmit sound. Acoustically



untreated rooms have an uneven frequency response. Thus what is performed can't be heard accurately. Appropriate acoustic treatment can transform a muddy sounding room, having a poor midrange definition and erratic bass response, into one that sounds clear and tight. To accomplish the correct equalization the accompanying things are to be achieved:

- It is important to prevent standing waves and acoustic interference from influencing the frequency response of recording studios and listening rooms.
- To decrease modal ringing in little rooms and lower the reverb time to assimilate or diffuse sound in the room to abstain from ringing and shudder echoes.
- Improve stereo imaging; and to shield sound from spilling into or out of a room.

There are a couple of different instruments for modifying the acoustic states of a room, semi-encased spaces and the outside environment. Their right use is important for conveying great acoustics. A portion of the acoustic treatments are:

- a. Sound Proofing:** Soundproofing of a room includes the disengagement of that room so that there is no leakage of sound to the outside environment and simultaneously no outer sound will have the option to go inside the room. This is cultivated via sealing openings, making the walls permeable of sound, and limiting the passage of sound vitality through the strong structures of the walls.
- b. Absorbers:** Absorbers are utilized to decrease reverberation, take out sound reflections and lessen the standing waves

that can muddy the sound. Safeguards are the most every now and again utilized acoustic treatment. All the time it is over utilized, which results in a dead sound impact in the room. A wide assortment of materials can be utilized as sponges to walls and ceilings. It relies upon necessity and environment. The materials additionally fluctuate in thickness and fit as a fiddle, which outcomes in various assimilation rating. The shape and thickness of the materials relies upon the particular sound necessities.

- c. Diffusers:** The second acoustic treatment is the utilization of diffusers. They are utilized to scatter the sound waves. This lessens standing waves and echoes. In contrast to assimilation, sound diffusers don't retain sound. Through this they save the vivacity of room. Such treatment is universally acknowledged as it is superior to making the room totally dead by covering the majority of the walls with retentive material. This additionally improves the discourse comprehensibility and the general listening environment.
- d. Bass Traps:** Sometimes it might be important to moist the low frequency response of a room and improve the quality of sound. Bass traps are utilized as the acoustic vitality safeguards to accomplish this. Acoustic interference happens when sound waves skip off the floor, walls, and ceiling and crash into one another inside a room. At the point when left untreated, this makes serious peaks and dips in the frequency response that changes as you move around in the room.

Acoustical measurement manages simply logical aspects of sound, for example, acoustic weight, vitality, or sound power. They can likewise be utilized to assess noise, vibration,



harshness, hearing damage potential or the quality of acoustic transducers, for example, amplifiers and microphones. A few sorts of acoustic measurement are:

Building acoustic measurements: These assess the sound protection between rooms, just as the noise transmission on account of strolling on floors.

Machinery noise measurements: These measure the irritation and potential hearing damage from office machines or vehicles, for example, air ship, autos, and other noise sources, for example, power plants and factories.

Acoustic imaging measurements: They are utilized as a diagnostic tool for imaging applications, for example, imaging of the human body where sound waves are perfect for measurement in delicate tissue just as for issue and break identification in mechanical devices.

Sound quality measurements: They are utilized in the entertainment industry, in home stereo systems to encompass sound auditorium sound systems just as in phone headsets and cell phones. Audiometry is the measurement of the human ear's capacity to hear and is important in assessing what sorts of hearing guides are attractive.

Data acquisition hardware for acoustic measurements normally uses 24-piece Analog to Digital Convertors (ADCs), hostile to aliasing channels and other sign conditioning. This sign conditioning may incorporate intensification, sifting, sensor excitation and input design. Another thought is the frequency range of the instrumentation. It ought to be enormous enough to cover the frequency range of sign enthusiasm, considering the range of the sensor. Devices accompany hostile to aliasing channels to prevent aliasing. They

diminish the maximum frequency range of the device to somewhat less than one-a large portion of the maximum sampling rate as prescribed by the Nyquist sampling hypothesis. Dynamic range is a common method to contrast the performance of one instrument with another. Dynamic range is a proportion of how little you can gauge a sign with respect to the maximum input signal the device can quantify. Expressed in decibels, the dynamic range is $20 \log (V_{max}/V_{min})$. For instance, a device with an input range of ± 10 V and a unique range of 110 dB will have the option to gauge a sign as little as 10 μ V. In this manner, the input range and the predefined dynamic range are important for deciding the requirements of the instrumentation system.

5. SOFTWARES USED FOR ACOUSTIC MEASUREMENT:

▪ ETF:

EFT is a product utilized for acoustic measurement. It is a PC based programming. It is recognized that it is an exceptionally exact and accurate PC based programming. The exactness in the outcome is because of the two channel MLS measurements. It yields accurate outcomes in the low standard PC sound cards. ETF can be utilized for journals and workstations as well. At that point it must be utilized with a test signal CD and half duplex sound cards. So as to accomplish better precision RS analog or digital SPL meter can be utilized for ETF.

▪ SMAART:

SMAART is one of the most widely utilized audio and acoustic measurement tools, a software application for the examination bit of acoustical measurements and instrumentation. Presented in 1996 by JBL's star audio division, it was intended to assist the live sound

designer with optimizing the linearity of sound fortification systems during the open performance not at all like most earlier examination systems which required explicit test sign sent to the sound system, ones which would be terrible for the group of spectators to hear.

6. PRACTICAL EXPERIMENTS:

Related with this theme a couple of practical analyses were taken up. The general studio acoustics required for the string, wind and percussion instruments that go under Karnatak music were contemplated. What's more, the microphones that suit the tonality of these instruments in both studio acoustics and live concerts in auditoriums were considered. The determinations may differ starting with one individual then onto the next; however these derivations depend on a common criterion

VIOLIN: Microphone for Studio: NEUMANN KSM 105, DPA DICADE.

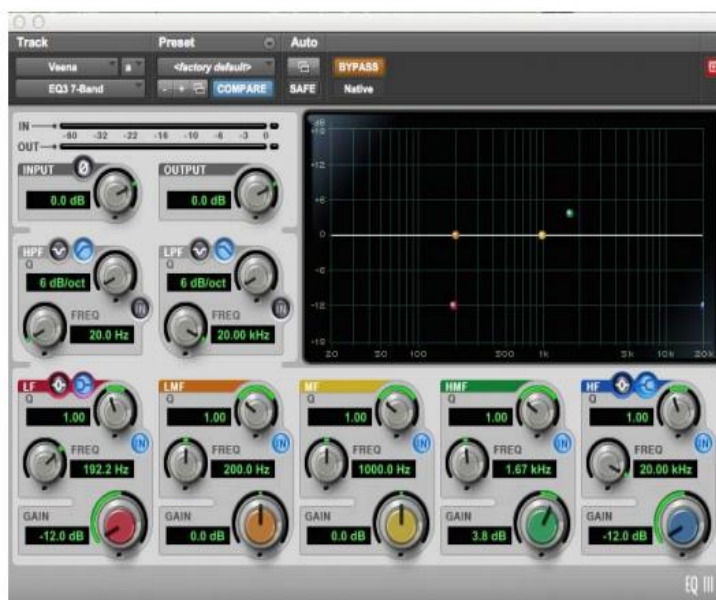
Microphones for Live: EV-ND 967, DPA 4099V Pickups: AKG C411, FISHMAN-V100, V200, and V300

VEENA: Microphones for Studio: NEUMANN U87AI Microphones for Live: DPA 4099G Pickup: AKG C411

The audio tracks of different instruments were taken and to this EQ, reverb, postponement and different impacts that suit the instruments and improve the tonal quality were included and the outcomes were examined. The spectrographs of different outcomes were likewise recorded.

VEENA:

Raw Track: The audio file with the number 001 has been recorded in the studio with Shure SM 97 microphone. This is raw file with the first tone of the Veena. This comprises of undesirable frequencies and playing noise, which diminishes its tonality



Veena with EQ, Reverb and Delay: In the audio track 004, to have a special effect, we have presented deferral of 678ms and the

increase of the postponement is - 3.7db from the first addition. The feedback of the deferred Veena is 17%.



VIOLIN:

Violin Raw Track: The audio document with the number 005 has been recorded in the recording studio with AKG C1000S

microphone. This is raw file comprises of unique tone of the Violin. This comprises of undesirable low frequencies and the bowing noise



Violin with EQ and Delay:

In the audio track 008, delay of 678ms, -2.2db gain, 52% mix level and 17% feed back

has been added to have a special effect sounding



7. CONCLUSION

Despite the fact that the recording technology has made significant interventions in the field of music, it is really the musicians who need to utilize it so that style and immaculateness of music isn't lost. In spite of specific downsides, the impulses and demands of music on one hand and the quick paced world then again have gotten a lot of revolution in the field of sound technology. So even in the days to come it might experience a lot more improves.

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