A History of Music Technology and Its Effect on Popular Music

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Music is a phenomenon. Its effect on man can be just as great as man’s effect on music. Pop music has been a major part of American culture for the last 80 years. It is often overlooked how great of a role pop music plays in one’s day-to-day life. Technology also plays an increasingly more and more important role in the one’s life since the 1950s. Technology is very similar to music in its ability to affect life. Both music and technology can affect one’s life for the better or worse. They can also affect each other. Since the very early 1900s, advancements in technology have made it possible to do things with music that could never have been imagined 100 years ago. Technological advancements make it possible to do more and more with musical instruments, composition, and especially recording.

The first thing to look at when trying to understand why popular music is a bigger part of your life than it may have been to your great-great-grandparents (assuming they were not musicians themselves) is the audience. Where and how do we listen to pop music? Alone on the bus with our ipod? Blaring out of 20-inch subwoofers at a dance club? Through the CD player in the car? Through the radio in the office? Playing in the background of your favorite movie when the good guy kills the bad guy? At a concert through the PA system? Through your 2.2gigahertz dual core MacBook Pro? All of these
things would have been impossible to do 100 years ago. Music becomes more accessible everyday. Surprisingly, it’s been barely over 100 years since the first recording was made on a phonograph.

Thomas Edison is credited with the invention of the phonograph. At first, it was only being used for entertainment purposes and to record speech. It wasn’t until about 1888 that the gramophone was developed as a means of reproducing sounds using discs as opposed to cylinders. Fred Gaisberg, who had worked for the United States Gramophone Company, opened the first commercial recording studio in 1897. This important piece of history is what eventually led to the massive commercial monster known as the record industry. During this same time, the development of the radio was starting to take off. It wasn’t until the 1920s, however, that the radio had developed enough to become a huge commercial commodity.

By the 1930s, a record player and a radio were a staple in any American home. Records were starting to be produced and distributed around the globe. The world finally had all the tools it needed to create the first pop music super stars and the pop music super stars had all the tools they needed to take over the world. Bing Crosby, for example, could easily be considered one of the first great pop stars in America. His career took off in the 30s and he soon became the biggest star on the TV and radio. His sold out live music performances turned the heads of up and coming superstars that followed in his footsteps such as Frank Sinatra and Dean Martin. It wasn’t uncommon to see Bing chewing up several spots on the top 100 chart during his peak.

Bing Crosby played and important role in the developments of sound recording also. He was smart enough to realize that his career depended on multimedia and that
advancements in multimedia could only make him even more successful. With Bing’s financial help, a small company called Ampex was able to develop the first commercially available reel-to-reel tape machine. This made it possible for Bing to pre-record his weekly radio shows. Until then, recording was usually done onto a 78 record. The records did not have outstanding quality and could only hold less than 5 minutes on one side. Obviously, this made it hard to record and play back a radio show without having constant breaks in the content. The reel-to-reel machine also made bettered recording in that the medium could be reused. Tape can be erased or reused by simply recording over it again. Bing Crosby furthered his involvement in the history of recording mediums by giving one of Ampex’s brand new reel-to-reel machines to musicians and inventor, Les Paul in 1948 (Millard, 1995).

Les Paul had already been experimenting with overdubs in the 40s before receiving his first reel-to-reel machine from Crosby. His first addition to this new machine was to add a recording head to create the ability to record another track onto the tape while simultaneously playing back what had already been recorded onto a previous track. Paul’s ideas lead to the ability to achieve multi-track recording. Soon, 3-track machines were available and being used by the newest acts of the late 50s such as Elvis and Buddy Holly. In 1958, the eight-track machine was developed and installed in several studios in America.

It wasn’t long after the invention of the reel-to-reel tape machine that the compact cassette was created so music could be shared in an even more portable fashion. While records were still very popular after the cassette’s invention, the cassette tape became the easiest way to distribute music. They were cheaper, more durable, took up less room, and
the quality did not differ greatly from the record. Cassettes also played a huge role in the development of young musicians because it gave anyone with a cassette recorder and a blank tape the ability to record themselves. It became even more important after the development of the Sony Walkman in the late 70s. Music lovers could now listen to their music whenever and wherever they wanted. It’s very hard for an American of a later generation to imagine what it could be like not having the ability to drown out whatever was going on around them by putting headphones on and continuing with whatever they are doing wherever they are doing it. The benefits of using magnetic tape for recording and the commercial distribution of music completely took over the ways of the past.

The Beatles, along with the help of George Martin, are now credited with creating groundbreaking recordings, although none of their early recordings were produced with the most current equipment for the time. Their first recordings in 1962 were only done on a two-track machine. The two-track machine limited them to monophonic recordings that included everyone playing the song together at the same time in the studio. The Beatles were also kept out of the control room. At the time, in England, it was very uncommon for the artists to have very much of a say in how the recording was going to sound. Everyone in the recording process had their specific job and that is what they stuck to. In America, the studios were years ahead of studios in England; even the now famous Abbey Road studios. The European studios decided it was time to catch up after producers began making trips out to America to see the advancements in recording technology.

After their first release, The Beatles were able to use four-track recording. This enabled them to use a virtually unlimited amount of tracks in their recordings. The only
problem that would plague them for several more years was the fact that there was not very much room for error. After all four tracks are filled on the tape, a mix must be made to free up an extra track. After this is done, there is no way to go back and modify a previous track. If there is something wrong, the only option is to start over from the top (Millard, 1995).

The introduction of multi-track recording enabled pop musicians to incorporate more symphonic sounds into their productions. The song could be recorded as a band, a track or two could be freed up after a mix, and they could bring in an orchestra at a later time to play and record along with the piece. For this reason, orchestration became fairly popular in the mid to late 60s pop recordings (Hertsgaard, 1995).

Recording for popular music no longer had to be thought of as “a live performance that has been captured on magnetic tape”. Now, artists, like The Beatles for example, were able to put a song together in pieces and create something in the studio instead of showing up to the studio with their work already perfected and able to play together in a live setting. A perfect example of that is their song “I Am the Walrus”, a B-side to their 1967 number one hit “Hello Goodbye”. The song featured the use of a Moog synthesizer and an incredible amount of tape looping. What they were doing then was actually an early form of sampling. The song also used what became a popular electronic instrument known as the mellotron. A mellotron is a keyboard instrument that actually plays tape loops that are stored inside of the machine based on what pitches are being played. There are 70 total keys that are split between two separate keyboards on the front of the machine. This instrument was also used in their famous “Strawberry Fields Forever” (Holmes, 1985).
The Beatles’ song “For the Benefit of Mr. Kite” includes several tricks performed on a tape machine. To create the psychedelic feeling of a circus, the group cut out small clips of tape recordings of organs, harmonicas, and even a circus steam calliope and then spliced them all together in a completely random order. There was no way for them to be able to tell what the tape would sound like when they played it back. This style of “chance” composition was mastered several years earlier by a famous composer named John Cage (Holmes, 1985).

Another great example of using tape loop samples is a song also by The Beatles called “Revolution 9” from their self-titled LP also known as the *White Album*. This song, had it not been on a pop album, would have fallen into a genre of music at that time known as *Musique concrète*. Like a common *Musique concrète* piece, “Revolution 9” was composed entirely of sounds you hear in your normal day-to-day life. With the use of fades, volume changes, speed changes, and even reversed loops, John Lennon of The Beatles composed a two and a half minute cluster of sound. The piece was widely accepted and looked at as a genius and original piece of art by many of The Beatles’ fans across the world. These styles and techniques used by group to create “Revolution 9” were actually in use for over 10 years by composers all over the world.

The blending of different styles of music done by The Beatles is what makes it close to impossible to classify every group or song into a specific genre. Descriptions of genres change from day to day as well. The words “rock and roll” could now be used to describe everything from The Beatles to more recent and completely different pop groups like Marilyn Manson or Def Leopard. Rock and roll develops right along side of technology in music. The developments in electric guitars and bass guitars in the 1930s
and 40s helped to make the beginnings of rock and roll possible. Rock music slowly started to build up throughout the mid to late 50s. The first “rock” album to hit the *Billboard* pop charts was Bill Haley’s “Crazy man Crazy” in 1953 (Millard, 1995). Throughout the 50s and 60s, the electric guitar became the driving force in rock and roll. The vast majority of the songs tearing up the pop charts since the 60s has been music that features the electric guitar.

The most revolutionary instrument accepted into the pop music world became popular in the 1960s. This instrument was the synthesizer. Though sometimes used to mimic acoustic instruments, the majority of early synthesizers created sounds unlike anything ever heard before.

The Theremin first became popular in music with the Beach Boys song “Good Vibrations” in 1966. Before that it was commonly used in films to create odd and eerie sounds (Montague, 1991). The instrument could also be heard in the Rolling Stones’ song “Please Go Home” in 1967. Although it is an extremely difficult instrument to play well, many artists use it to create more of an effect than how they would use a melodic instrument to create melody or harmony. It has an electric sound like nothing ever used in music before.

One early synthesizer used in popular music was the clavioline. The clavioline most famously appears in Del Shannon’s 1961 hit “Runaway” and The Beatles’ “Baby You’re a Rich Man” in 1967. For the most part, the majority of pop musicians using synthesizers in the 60s were creating psychedelic sounds. The synthesizers ability to create washing, reverberated, and flanging sounds is what originally drew it into the pop music world. A synthesizer created by Bob Moog quickly became the most popular of
these psychedelic synthesizers. According to Trevor Pinch and Karin Bijsterveld in their article *The Reception of New Technology in Music*, the Moog was sold at the legendary 1967 Monterey Pop Festival to a number of famous musicians (2003). Soon after the instrument started popping up on several mainstream artists’ albums such as the 1966 albums *Good Vibrations* and *Pet Sounds* (The Beach Boys) and the 1967 albums *Strange Days* (The Doors), *The Notorious Byrd Brothers* (The Birds), *Sergeant Pepper* (The Beatles), and *Days of Future Passed* (The Moody Blues) (Pinch & Trocco, 2002).

Bob Moog’s business grew and grew and in 1968 it blew up when Walter (later known as Wendy) Carlos released a multi-platinum selling album called *Switched on Bach*. Although it is considered a “classical” album, it played a huge role in the pop world. The sounds heard on this album were unlike anything achieved in the recording world before. The collection of classical Bach pieces was performed completely on Moog synthesizers and with the help of some recording tricks like speed adjustments, tape dubbing, and splicing. The only thing holding the Moog and other synthesizers back at the time, however, was portability. Until shortly after the release of *Switched on Bach*, synthesizers were only used in a recording studio setting and could not easily be transported to live events. There were only few who dared to go out on the road.

Mother Mallard’s Portable Masterpiece Company, lead by David Borden, was the world’s first Electronic Ensemble. They formed in 1968 and did their first live performance in 1969. Their original performances were done mainly with the use of Moogs. To help the portability issue, Bob Moog soon developed a smaller version of the Moog called the Minimoog. The first performance featuring a prototype of the Minimoog was done at Cornell in 1970 (Pinch & Trocco, 2002). It was around this same time that
Emerson Lake and Palmer’s hit “Lucky Man” hit the airwaves. The tune featured a memorable Moog solo and turned a lot of heads after it’s debut. The Minimoogs did not solve all of the problems for early synthesizer lovers though. The oscillators in them would still go out of tune at the slightest change in temperature. They were very needy instruments at the time, which still kept them mainly in the studio and off of the road for several more years. This use of synthesizers gave musicians at the time more tools to work in recording their music.

By the early 1970s, multi-track recording was the only way to do it in a major recording studio. It wasn’t uncommon by then to see single artists putting out albums on their own while playing every instrument. Todd Rundgren released his third solo album *Something/Anything?* in 1972. The album was a double LP of which he played every single instrument on the first 3 sides. The majority of the songs are full band arrangements and all of them include several layers of vocal parts (also performed by Rundgren). By this time, magnetic tape recording had jumped from eight to 24 tracks. The possibilities in recording literally tripled. With so many tracks available, it gave artists the ability to record songs one piece at a time. Many solo musicians, like Rundgren took advantage of that.

Another new tool in music making during the 1970s was the drum machine. At first, drum machines could only produce synthetic sounds that resembled drums but soon progressed into drum machines that used samples of actual drums. The machines could be used to create a beat that would loop over and over. The drum machine soon led to a new genre of pop music known as Disco. During this time, the role of the producer became even more important than before. The producer was now able to change a song
around however they wanted. Synthesizers, drum machines, some recorded tracks by the band, and some imagination are all that was needed to produce a disco song. As the producer’s role became more important, however, the role of the artists became less important. It wasn’t uncommon for a song to be released with several different versions or remixes. Hits were often released as a short version for the radio and longer versions for DJs to use in dance clubs.

The disco era was also the beginning of the club scene. Most disco songs were much more danceable than the psychedelic sounds of the 60s. Extended versions of songs were used by DJs who would play a portion of one song and transition the song into another song with the use of two record players and a mixer. This technique, used to achieve non-stop music, is still standard practice in clubs today. However, today it can be done with the use of CDs or audio files on a computer. Each technique still has its own benefits today.

The danceability of disco music combined with the technology of the time immediately paved the way for another new genre known as hip-hop. Hip-hop music started with borrowing clips of songs combined with dance beats. DJs would play disco records in clubs while combining the songs with other songs by scratching, looping, and blending the two together. Soon, people would rhyme over these beats created by the DJs in clubs. This style became popular enough for artists to record their work. This process eventually lead to the creation of the hip-hop and rap music that is on the market today. Sampling other recordings is still very popular in hip-hop and rap music although there are many legal issues often preventing such work to be sold. Artists add samples of music from all over the world and any time period into their “beats”. This has repeatedly proved
to benefit artists commercially. If the listener recognizes and is a fan of the tune that the artist is sampling, there is clearly a better chance that they are going to like the song they are hearing. The art of sampling has since spread out of hip-hop and rap and into all other forms of popular music.

In 1998, British pop artist, Fatboy Slim, took a soul/funk recording of “Take Yo’ Praise” sung by Camille Yarbrough, and constructed a song that climbed its way right up the pop charts. Parts of the original 1975 recording are heard at the beginning of Fatboy Slim’s version titled “Praise You”. After being run through some effects and processes, the song sounds different, but is in fact just a manipulation of the original recording. A short way into the song, a thick crunchy bass line enters with a pounding drum beat. From this point on the song sounds nothing like the original 1975 version, but the main melody line of the original reappears as the “hook” several times through out Fatboy Slim’s 1998 version (Katz, 2005). This type of sampling is very popular today in pop music.

In the early 90s, there was a popular rap group called Public Enemy. The group based the majority of their music solely on rhyming over beats made up mainly of samples. In one of their biggest hits, “Fight the Power”, they use over 20 samples from all sorts of recordings. There are samples used from the 1982 Trouble Funk song “Pump Me Up”, the 1972 Dramatics song “Whatcha See Is Whatcha Get”, Clyde Stubblefield’s song “Funky Drummer”, James Brown grunting, as well as the 1971 James Brown song “Hot Pants”. In an interview with Chuck D., a member of Public Enemy, the artist explains that within a 4 second clip, they would commonly use as many as ten samples to
make up just a few measures, then loop that compilation over and over to create a beat for a song (Katz, 2005).

Up until the last few decades, there were no major legal issues with sampling. Now, due to copyright reasons, artists have to obtain permission by the copyright owners of a recorded song before they are allowed to use it in their own work. Of course, like any legal issue, there are several rules to follow that allow sampling to be acceptable in some cases and illegal in other cases. For the most part today, if an artist wants to borrow something from someone else, they’re going to have to ask first. The majority of the time they’ll also have to pay.

Now, with advancements in digital recording, possibilities seem to be endless. There are very few limitations in recording aside from digital storage space and processing speed. Artists are rarely limited on the number of tracks they could record or the effects they could use. The art of sampling has benefited greatly from current digital audio workstations like Pro Tools and Logic. Looking back at how far music technology has come in just 100 years, it’s almost impossible to imagine what is in store for musicians 100 years from now.
Reference


