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The Synthesizer: Modernist and Technological Transformations in Film Sound and Contemporary Music

Dusin J. Green
Claremont McKenna College

CLAREMONT McKENNA COLLEGE

THE SYNTHESIZER:

MODERNIST AND TECHNOLOGICAL TRANSFORMATIONS

IN FILM SOUND AND CONTEMPORARY MUSIC

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DUSTIN GREEN

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__Introduction__

The Invention of a Sound

The sound synthesizer is the ultimate electronic instrument. Traditionally in the form of a keyboard, synthesizers generate electronic signals which are converted to sound through a medium such as speakers or headphones. With its invention, the possibility of creating virtually any sound was achieved. Since its initial emergence, constant technological advancements in the field of electronic instruments and synthesizer technology led to an explosion of electronic sounds in music. As a result, transformations within film and popular music transpired that never would have happened as the result of any other instrument's invention.

The first synthesizer was constructed in 1955 by Harry Olsen and Herbert Belar as a device for the artificial creation of human speech. The RCA synthesizer was far too enormous and difficult to program for it to be a practical instrument for musicians to make use of. Four years later however, the Mark II version of the RCA synthesizer proved to be capable of producing a wide range of sounds, as well as maintain a high degree of control over pitch, volume, duration and timbre. But in 1964, Robert Moog invented the first truly practical electronic musical instrument in the modular voltage-controlled analog synthesizer, which allowed for musicians to 'tune' their equipment and create sounds with more speed and precision (Griffiths 1979, 18-19).

The modern voltage-controlled synthesizer was more portable, less expensive, much easier to operate and perfect for small spaces and limited budgets. In *Electronic Music: A Listener's Guide*, Elliot Schwartz distinguishes between the technologies. RCA synthesizers could still create sounds and alter those sounds, as well as control the material as a whole, but all of this was done arduously by hand. The modern synthesizer has tiny interconnected modules and transistors to create and alter sounds, but more importantly, the composer can alter the material such as the pitch, timbre and tempo easily, "not by fussing with knobs or splice tape," but by simply "applying voltages to electronic signals." All of this can be done at one place, such as the synthesizer console, and can be "'performed' in 'real time,'" ideal for live performances (1975, 68-69).

Since Robert Moog and the Moog company first pioneered the voltage-controlled synthesizer technology, over the next several decades, technological improvements would take place such as the miniaturization of parts, and numerous synth manufacturers would join the growing industry. Eventually the synthesizer and electronic drum kits, as well as improvements such as MIDI technology, would all blend into the form of electronic instrument software, becoming a supremely feasible tool for creative musical purposes.

Modernist Ideology in Music: The Case of Ferruccio Busoni

A century ago, composers wanted to bring change to a world of music that had been relatively unchanged for centuries. In the era of modernism and technological innovation, musicians were ready to explore the realm of sounds and make truly progressive music. The modernist movement in the arts rejected traditional "form." Naturally, notions of form becoming outdated would translate to music. Advancements in the technological revolution of the late nineteenth to early twentieth centuries were largely electricity-based. Throughout the next

century, new advancements of electrical technology would become the major contributor to musical innovation and modernization.

Ferruccio Busoni's manifesto "Sketch of a New Esthetic of Music," published in 1911, contributed to this expanding notion that music could be revolutionized. Busoni asserted that for centuries musical form had generally been static, and that great composers like Bach and Beethoven had laid down the laws for proper musical form. By contrast, Busoni claimed that all music is born free, and that musicians had to distance themselves from the shackles of form, because to Busoni "Our lawgivers have identified the spirit and emotion, the individuality of these composers and their time, with 'symmetric' music, and finally, being powerless to recreate either the spirit, or the emotion, or the time, have retained Form as a symbol, and made it into a fetish, a religion" (6-7).

A principal theme of Busoni's manifesto is a crusade against the scale system of traditional music of the West. He asserted that the octave could be divided into more than twelve notes, as nature allows for an infinite progression of tones. Busoni was one of the first musicians to explore the option of electronic instruments. He took great interest in a recent invention at the time, Thaddeus Cahill's Telharmonium, sometimes called a Dynamophone. The instrument particularly sparked his interest for the purpose of achieving infinite gradation of the octave. Busoni enthusiastically wrote that "[Cahill] has constructed a comprehensive apparatus which makes it possible to transform electric current into a fixed and mathematically exact number of vibrations," the vibrations being what controls the pitch (33).

The Telharmonium is often referred to as the first electronic instrument. Introduced publicly in New York in 1906, the Telharmonium foreshadowed the future of electronic musical

instruments; however, because of its massive size, high expense and power consumption, as well as technical difficulties (high voltages caused interference with users of the telephone system), the Telharmonium and its sound never broke out into the world of modern music (Pressing 1992, 6). Many more electronic musical innovations came to follow the Telharmonium in the early part of the twentieth century, but like Cahill's invention, none of them ever really achieved a significant impact on the musical world. It wasn't until the development of the synthesizer that music could truly be transformed.

The impact the synthesizer had on music is far greater than imaginable at the time of its creation. Obviously, the instrument added an entire realm of possible sounds to use in a given composition. But it also brought about a change in the concept of modern music, a change that can be seen in almost any form of modern electronic music. The conceptual change that the synthesizer brought to music with its creation was a focus on the *sound* itself (Théberge 1997, 186). Before the synthesizer, all instruments came with a given sound and composers understood this, so their creativity had to come from the instrumentation. Busoni believed that musicians were even further limited creatively, not just from a finite number of sounds, but also from the bonds of form. The ability to produce any sound through a synthesizer shifts the composer's attention away from more traditional musical concepts such as melody, harmony and rhythm to a more attentive detail to sound.

While the creation of the synthesizer had such a massive effect on the musical world, its impact wasn't seen immediately. A few popular musicians of the late 1960s and 70s experimented with the new musical technology, and some utilized it quite successfully. However, with its usage in film scoring the synthesizer truly found its value. Film composers no longer were limited to the sounds of a traditional orchestra when trying to capture the emotion of

the on-screen visual. Therefore, it is only natural that the instrument of infinite aural possibilities would coincide wonderfully with film.

Interestingly enough, Busoni uses Wilhelm Richard Wagner as a primary example of composers who were confined to the limits of form. Wagner, a German composer of the post-romantic era, has been credited with playing a huge role in influencing classical film composers of the twentieth century (Hickman 2006, 3). But for Busoni, this was exactly the problem. Composers learn and borrow ideas from other composers, but in actuality that hinders their full potential for creativity. The synthesizer brought an enormous change to film scoring, one that Busoni would have likely welcomed. The synth dismissed the norms of classical film scoring. The possibility of any timbre discarded the need for complex orchestration, and often film scorers did exactly that; they disposed of the traditional orchestra entirely, and replaced it with one ultimate electronic sound creator.

Around the same time that the synthesizer's capabilities were being realized in film scoring, popular music was finding a role for the electronic sound as well. Disco and early forms of electronic dance music welcomed the new instrument. The entire music industry began to shift away from traditional orchestration and replace it with synthesizers and drum machines. The conceptual change in music that could be seen in film scoring with the synth's emergence could also be seen in these rising popular genres. Whereas the shift in focus from form to sound might cause the deficiency of complex rhythm or melody altogether in film scoring, it similarly led to a kind of default "four-on-the-floor" beat in disco.

But here we have come full circle. With the development of the amazing synthesizer, the possibility of achieving any sound within a single mechanism was reached. Feruccio Busoni

almost certainly would have applauded the new instrument, as it does not constrain one to previously explored sounds, and ultimately allows for infinite creativity for a musician. We can appreciate this creativity for sound in film scoring from synth scores of composers such as Wendy Carlos, Vangelis and Giorgio Moroder. But with the shift in focus to the sound itself, creativity in areas of musical form such as rhythm became disregarded, something that can be easily understood by listening to a few disco tracks in a row. And ultimately, decades later, all genres of contemporary electronic music have a default rhythmic and song structure. So whereas the synthesizer brought with its creation the possibility of infinite creativity, at least in regards to sound, it ultimately came to be a part of a whole new set of musical norms, norms which Busoni would likely argue have once again halted creative musical progression.

Film

Foundations of Film Music and Richard Wagner

 Cinema has always been a vehicle for musicians to find work and express creativity. Ever since the silent film era, music has been an essential feature of all movies. The first venues for film presentations were large theaters, as cinema was presented as a part of theatrical entertainment, such as a vaudeville performance. It was typical then for a live theater orchestra to accompany the film. But in 1907 with the invention of nickelodeons, small structures intended for viewing films exclusively, it wasn't practical to include a live orchestra. In a nickelodeon, music was often played in the background on a mechanical device such as a phonograph. Other times, the nickelodeons would include a live piano player to fulfill a variety of musical needs for the film presentation, and sometimes a small number of musicians would accompany the pianist, such as a drummer, especially beneficial for sound effects (Hickman 2006, 59).

 By 1920, America entered into the golden age of silent film. The size of musical ensembles in movie theaters was expanding. Incorporating excerpts from nineteenth-century classics, known as compilation scores, became common in film scoring, and even original film scores for specific films were beginning to develop. Prior to the emergence of sound films, the movie theater was the largest employer of musicians in the world (Hickmam 2006, 87). In 1926, silent films with no dialogue but synchronized music and sound effects began to emerge, but this only represented a brief period of film history. Finally, with the emergence of sound films, we

begin to see the growing trend of the classical film score. The classical film score is characterized as "wall-to-wall," meaning the orchestra essentially never stops playing from the beginning of the movie until the end. The classical film score puts an emphasis on orchestration and is very symphonic sounding. Themes through the presence of leitmotifs are usually played during opening credits and familiar melodies are often repeated throughout the score. Most importantly, the classical film score is melody dominated, and in the emotional postromantic style that Richard Wagner made so popular (Hickman 2006, 125-126).

Wagner's dense, melodic and complex operas were created in a new style that had never before been heard at the time. He wrote of "Gesamtkunstwerk," a German word for "total artwork." His belief in creating a total work of art is apparent in his unification of music and drama in his works. He eliminated box seats to create a classless theater and darkened the audience for the purpose of creating an illusion that the audience was not there. He popularized the leitmotif to represent aspects of the story (Hickman 2006, 5). Wagner's artistic concepts for opera translated beautifully to film music. Classical film composers such as Max Steiner, Franz Waxman, Dimitri Tiomkin, Erich Wolfgang Korngold and Alfred Newman emulated Wagner's style. Like Wagner's operas, film scores from these composers are filled with a wide range of emotions. There is an emphasis on melody and an inclusion of colorful orchestrations, and as music Professor Roger Hickman writes, "Such qualities are ideally suited for the needs of film; the style is flexible, powerful, and unobtrusive" (2006, 40).

Edgard Varèse

Edgard Varèse is a composer whose style is in direct contrast to these classical postromantic composers. Sometimes referred to as the inventor of electronic music (Holmes

2008, 17), Varèse was decades ahead of his time, when considering the available and practical electronic instruments, or lack thereof, in the early to mid-twentieth century. It should come as little surprise that Varèse was a principal student of Busoni. Musicians like Busoni and Varèse felt the need to bring change to a conservative world of music (Griffiths 1979, 11). In his "Sketch for a New Esthetic of Music," Busoni goes on a tirade against Richard Wagner and his composition style, one which relies on seamless form. Dense melodies and rich traditional harmonies permeate Wagner's operas, and the desired timbre was achieved through the arrangement of instruments. For Busoni, Wagner was the embodiment of all traditional, form-heavy classical music. Busoni deeply desired to deviate from this traditional style of composing. He passed that desire along to his main pupil.

Like Busoni, Varèse was one of the first musicians with the desire to experiment with new instruments to achieve original sound. In an article for the British national newspaper, The Guardian, Gillian Moore writes of Varèse's desire for new musical tools:

> Varèse spent years creating a kind of proto-electronic music for live musicians, using percussion and conventional instruments to build great sound masses, unearthly harmonies and noise-based music that sounds for all the world like it could have been made in an electronic studio. The wailing sirens, the industrial percussion and scientific titles such as Integrales, Ionisation and Hyperprism speak of the machine age. Yet, I often get the feeling when I'm listening to Varèse that the music has existed since the beginning of time: sounds seem to call out across the universe, to be at once audaciously futuristic and unutterably ancient. (2010)

Varèse's music was drastically different from anything that had ever before been composed at the time. His fascination with the relationship between noise and sound was an unexplored concept. The focus on the sound itself he brought to his music was something that would be seen

decades later with the emergence of the synthesizer. Most importantly, Varèse's music lacked proper form, as the term was traditionally understood. His music was the opposite of Wagnerian.

Whereas Richard Wagner is seen as the architect of the postromantic style that dominates the classical film score, Edgard Varèse should be understood as the innovator for film composers using electronic sounds to come. Although Varèse wasn't exactly a major film composer (according to the Internet Movie Database, he composed for two films; *Garabatos* (1964), a documentary short, and *C'est beau* (1980), a TV movie), neither was Wagner, who died decades before the emergence of the traditional film score. The revolutionary, yet completely opposite, styles of these two composers, influenced and inspired future film composers.

The main explanation for why the postromantic style that Wagner was notorious for had such an influence on film composers of the twentieth century is the high level of emotion inherent in his postromantic sound. The Romantic era of the early to mid-nineteenth century attributed emotion to the main source of the aesthetic experience. Realism of the latter half of the nineteenth century then rejected Romanticism and its chief element of exaggerated emotion. Reviving the Romantic style, Wagner's operas flowed with emotional highs and lows and the music accompanied the action beautifully. It only makes sense that the same musical techniques would transition wonderfully to cinema. Whereas the emotion in Wagner's music is found in the form, with building melodies, beautifully layered harmonies, familiar scale structures and their associated significance to the musical plot, emotion will be found in the sound itself in an electronic film score.

Although Varèse's music sounds appropriate to inspire film composers of his time, this was not the case. The techniques he employed to achieve the electronic sounds in his music were

highly unorthodox. In short, his music was wildly ahead of its time. It wasn't until the 1970s and 1980s when composers for film were commonly able to fully utilize the electronic sound. With the synthesizer, film composers were given an entire new universe of sounds.

The Synthesizer's Application in Film

The synthesizer can be heard in film music in three major categories. In addition to the traditional score, in which the synthesizer is used to mimic other instruments and in many cases an entire orchestra, there are also many films which employ the popular score, in which the synthesizer can be heard mainly in association with rock and pop musicians. However, the most significant group of film scores to the synthesizer's true impact on an entire era is the modern film score, in which "keeping its original association with electronic music, the synthesizer can be used to create an electronic score with new colors" (Hickman 2006, 358).

Paul Tonks writes in *Film Music* that "Science fiction was the main genre to explore the burgeoning musical capabilities of electronics" (2001, 57). As all science-fiction deals with technology, it was the appropriate medium to display sounds which relied on a new technology. It is only natural that the genre of technology would appropriately go hand in hand with the instrument of technology. Electronic sounds would naturally accompany sci-fi narratives of science and technology, the future, space travel and the paranormal. In other words, the synthesizer was, and still is, the perfect tool for science-fiction film.

2001: A Space Odyssey (1968) and *Star Wars* (1977) are arguably the two most significant films for the rise of the sci-fi genre; however, while neither film contains any extensive use of the electronic sounds, it was these films' success which paved the way for many more films of the genre to be produced, a large majority of which utilized the synthesizer's

versatile range of sounds. Today we understand sci-fi as a legitimate genre of film, but that was not always the case. It took Hollywood longer than one might expect to fully accept topics of science-fiction as a serious means for a film narrative. Although a few films of the genre were made as early as the silent era, such as Georges Melies' *A Trip to the Moon* (1902) and Fritz Lang's *Metropolis* (1927), the genre never really took off until Stanley Kubrick's *2001: A Space Odyssey* in 1968. Following Kubrick's breakthrough work, science-fiction films of the 70s became abundant, especially following the massive success of George Lucas' *Star Wars* in 1977.

The synthesizer was the major musical foundation for most science-fiction film. Once again, *2001: A Space Odyssey* and *Star Wars*, breakthrough films for the science-fiction genre as they were, did not really utilize the synthesizer at all. John Williams, who re-popularized the classical sound, composed his score for *Star Wars* is in the same traditional postromantic style that composers such as Korngold, Newman and Steiner made standard for film scoring of the early to mid-twentieth century. Kubrick originally asked composer Alex North to score *2001: A Space Odyssey*, but instead decided to have the film music be an adapted score, one which uses exclusively existing pieces of music as they already were (Hickman 2006, 302). Kubrick wanted the film score to resemble the "guide pieces" he had chosen, and when he was not satisfied with his composer's efforts to recreate the example music he provided, he made the executive decision to just use the guide pieces themselves in the final product.

In a conversation with David Kraft for *Soundtrack* Magazine, North reveals that in his efforts to create an original film score for *2001*, his orchestra had "about 110 players, with two organs and eight percussion." And when Kraft asks North about his referring to his own score as contemporary, and nothing like the "John Williams type symphonic 'space/science fiction' score," North replies with, "No…Very dissonant and contemporary" (1985). Although North

never touched a synthesizer for his score for *2001*, it is still apparent that he attempted to break

away from the norms of the traditional 'John Williams type' film score. 'Contemporary and

dissonant' are two terms often associated with the synthesizer, so one can draw that North's

scoring style for *2001* predated science-fiction film scores of the synth to come.

Only one of the pre-existing pieces of music Kubrick employed in *2001: A Space*

Odyssey really incorporated the electronic sound:

> One of the more famous moments in Bell Labs' synthetic speech research was the
> sample created by John L. Kelly in 1962, using an IBM 704 computer. Kelly's
> vocoder synthesizer recreated the song "Bicycle Built for Two," with musical
> accompaniment from Max Mathews. Arthur C. Clarke, then visiting friend and
> colleague John Pierce at the Bell Labs Murray Hill facility, saw this remarkable
> demonstration and later used it in the climactic scene of his novel and screenplay
> for "2001: A Space Odyssey," where the HAL9000 computer sings this song as he
> is disassembled by astronaut Dave Bowman" (Bell Labs).

In this monumental scene, in which the homicidal supercomputer HAL9000 attempts to sing the

popular Harry Dacre song, "Daisy Bell (Bicycle Built for Two)" as it is being disassembled, the

lyrics are sung in a voice that is octaves below any normal speaking voice. The tremendously

low pitched computer voice torments the viewer, who understands that the cold, synthetic voice

is far from human and basic human feelings. Paul Griffith's writes in *A Guide to Electronic*

Music that "In the field of vocal music with language, electronic music has been no less

important in establishing new possibilities… Techniques of distortion, when applied to sung or

spoken language, can place the meaning in doubt, so that the sound of the words is more

important than their sense…" (1979, 36). HAL9000's robotic rendition of "Daisy Bell" was not

really lyrically significant to the film's narrative; however, once again it is the sound itself that is

the focus for the viewer when dealing with synthesized sound. The terrifyingly low pitched voice of the supercomputer has enough of an effect on the viewer, regardless of what the lyrics are saying. But while Griffith's notes that often with a synthesized voice in music, the lyrics become somewhat irrelevant, in this haunting scene from *2001*, the merry and idealistic lyrics of "Daisy Bell" contribute even further to the concept of the music playing against the on-screen action, a common film scoring technique.

Wendy Carlos's electronic score for Steven Lisberger's *Tron* (1982) reflects the digital world in which the film takes place. Today, hearing an electronic sound in music would not cause anybody to think twice, but at the time of its emergence, the synthesizer's sound was perceived as something very "futuristic." Vangelis takes advantage of the futuristic sound of the synth in his score for Ridley Scott's *Bladerunner* (1982), a film that takes place 27 years into the future from the time it was made. Brad Fiedel's metallic, militaristic score for James Cameron's *The Terminator* (1984) works ideally with the film's plot. These are just a few examples of science-fiction film composers for wildly successful films, taking advantage of the new technology of the synthesizer decades ago to accommodate the themes of the films they scored. Although the synthesizer found a perfect home for its sound to flourish in the explosion of science-fiction films of the 70s and 80s, sci-fi was not the only genre in which synth scores were abundant.

In addition to science-fiction cinema being an appropriate medium for musicians to explore with the new sounds of the synthesizer, the instrument also found a place for itself in horror films of the same era. Because of the synth's versatility and ability to produce any sound, including those sounds that are not necessarily pleasant on the ears, it was the ideal instrument for simply employing disturbing noises to accompany the horror film. Low frequency vibrations

could be used to build tension or piercing high pitched shrieking sounds could unnerve the audience during a particularly horrific scene. Or perhaps a variety of dissonant colors could be combined to create an ultimately disturbing clatter of noise.

A prime example of the synth score in horror film is Wendy Carlos's score for *The Shining* (1980), also a Stanley Kubrick film. Carlos employs a multitude of synthetic, ear piercing sounds to suggest the escalating insanity in the minds of the main character played brilliantly by Jack Nicholson (Jack Torrance) and his family. Paul Tonks articulates that synthesizer composers for film of the 70s and 80s would create their scores with "teeth-grating electronic sound design. Horror movies require musical sleight of hand more than any other. For these two decades, electronic howls, squeals, icicle drips and screams did the job because keyboards and anything electronically off the wall were in" (2001, 62). Kubrick's *A Clockwork Orange* (1971), although perhaps not an ideal fit to the horror genre, deals with themes of the genre, such as violent and disturbing images, as well as moral and psychological demise. In comparison with the classical pieces of music employed in the film's narrative (part of Alex's psychological conditioning), Wendy Carlos's heavily electronic score for the film highlights the synthesizer's unique and disturbing sounds in comparison with the sounds of Beethoven's symphonies. John Carpenter's simple score for *Halloween* (1978) contained an infamous single piano riff and dissonant sounds from the synthesizer. Movie critic James Berardinelli makes the claim that "Despite being relatively simple and unsophisticated, *Halloween*'s music is one of its strongest assets. Carpenter's dissonant, jarring themes provide the perfect backdrop for Michael's activity, proving that a film doesn't need a symphonic score by an A-line composer to be effective" (Reelviews).

The declining appeal of the symphonic score is fundamental in understanding the synthesizer's significance and value for filmmakers. The absence of the large orchestra from films that utilized the synth score meant a much more cost-effective final product, contributing to the instrument's overall value in the industry. One film whose history exemplifies the electronic score's value in scoring is *Metropolis* (1927), a German expressionist science-fiction film by Fritz Lang. The film was originally scored by Gottfried Huppertz in a Wagnerian symphonic style; however, since the film's release almost ninety years ago, it has been subject to several re-releases with different soundtracks, many of which are electronic. This is once again of course revealing of the naturalness with which the science-fiction genre and the electronic sound overlap. But more than that, it shows how the single instrument of the synthesizer was easily able to fill a role that was previously occupied by sometimes as many as hundreds of musicians in an orchestra. In 1975, William Fitzwater and Hugh Davies composed an electronic score for a BBC showing of the film (Goldsmiths, University of London), and in 2000, American producer and DJ Jeff Mills released an album called Metropolis, intended to be a full techno score for the film (Discogs). While these examples are noteworthy in revealing the synthesizer's possibilities, no recreation of the Metropolis soundtrack was as significant as Italian producer Giorgio Moroder's version of the score, released in 1984. Moroder's soundtrack consisted of seven pop music tracks that he wrote and performed alongside contemporary artists of the time such as Pat Benatar, Bonnie Tyler and Freddie Mercury (Stephen Dalton, The Quietus, 2012). The new score was part of a 1984 re-releasing of the entire film. Moroder's synthesized pop-rock score was representative of a common trend in film of the time with the overlapping of popular music into the world of film.

In conclusion, the symphonic approach to film music is only slightly younger than film itself. The medium of film had to wait about 70 years for sound technology to catch up and afford films the chance to include any sound imaginable. When it finally did, the world of film music found itself in a midst of modern synth scores of all aural colors. Film composers would take advantage of simple, yet never really before heard electronic sounds to emulate the future or the supernatural in sci-fi, or tap into basic human instincts with belligerent electronic screams in horror films. The sound itself being the focal point for music of the synthesizer was ideal for cinema. Traditional symphonic scores are understood as better when being able to stand on their own, without the visual accompaniment of the film. The modern synth score turned that notion on its head, because whereas the traditional score is able to stand on its own due to the Wagnerian postromantic musical form inherent in its nature, the modern synth score had very little form, if any at all. Synth scores were sometimes deficient of melodies, harmonies, and rhythms altogether, not to mention the usual indifference to the traditional Western scale system that film composers of the synthesizer display. Instead, scores were collections of countless possibilities of sounds; sometimes dissonant, sometimes beautiful, usually unusual, always innovative. The infinite possibility of sounds along with the disregard for form that the synthesizer brought to film music suggests that Ferruccio Busoni might agree that the modern synthesizer score might be the nearest thing to ultimate musical creativity.

Music

Popular Music and the Limits of Form

At the time this massive shift of sounds in film music was developing, the synthesizer also brought about a significant change in popular music as well. But that is not to say that these two spaces for electronic sounds in music were completely separate entities. Musicians such as Giorgio Moroder would oftentimes overlap into both worlds of sound, revealing the synthesizer's potential for versatility. Likewise, just like Moroder going from popular forms of music like disco to film music, sometimes film composers would be drawn to making popular music, collaborating with rock musicians who were oftentimes more knowledgeable than themselves about the synthesizer (Hickman 2006, 359). The synthesizer's presence in film music as well as an extensive range of genres in popular music of the 60s, 70s and 80s, such as rock, disco and synthpop is telling of its usefulness in music. The instrument's flexibility is inherent in its nature.

But while the ability to produce any sound that the synthesizer can create naturally allows the instrument to have the potential to be used in any kind of music, with any form (or no form at all), a general trend of musical form began to emerge among synthesizer music. But that is not to say that the synthesizer is the catalyst that brought about the new standard in music form. Modern music form of the West can be earliest and easiest identified in rock & roll music, which came from jazz. In the early twentieth century, the growth of African-American blues, an

evolved form of spirituals, evolved again into jazz and then swing. After big band then emerged

country and rhythm and blues, genres which heavily influenced rock & roll of the late 1940s and

50s. In the 60s, funk emerged, another subdivision of jazz and soul music. The synthesizer found

a home for itself in the world of progressive rock and funk; and, in the 1970s, with the surfacing

of disco, the synthesizer flourished in popular music. Inherent in the definition of popular music

is an appeal to the masses valued over musical imagination.

What all genres of Western music have in common, from jazz to disco, is a general

common form. Understand that these trends of musical form are more of a generalized

observation, and not an exact science. Not all music of the West has the same formal

characteristics, but there are noticeable formal tendencies for musicians of the twentieth century.

The general formal characteristics that took shape in this music are as follows (once again this

does not apply to all music, just a healthy majority): a 4/4 time signature (or common time),

sections of even length (usually containing four or some multiple of four measures), and a

traditional Western scale system (generally always major or minor). The melody is simple with

little harmonic supplement. There is an attention to the root scale degree and often the major or

minor triad plays a large role in the melody. Busoni complained of the rigidness of Western scale

system and basically referred to major and minor as one in the same. Even though they are

"opposite" scale systems in the minds of many musicians, Busoni argued they really are identical

(with the exception of the third and seventh scale degrees, usually) in the grand scheme of tonal

progression.

Regarding the generics of the rhythm section, the beat is simple and the rhythm

consistent. There are snare hits or claps on beats two and four. Quarter note, eighth note or

sixteenth note closed hi-hat cymbal hits are customary. Open hi-hat hits on the offbeat are also

very common, a trend that never eased up the as offbeat hi-hats have become a staple in all forms of contemporary electronic music. If the hi-hat hits are not arranged in one of the steady ways listed above, there is room for variability through syncopation. Likewise, the kick drum will often have some kind of a syncopated rhythm, if not a typical "four-on-the-floor" beat.

The overall structure of the musical piece is consistent, consisting of an introduction, verses, a chorus and often a bridge and/or conclusion. Although these were the characteristics of jazz music early in the twentieth century, they stuck around and inhabited all genres of popular music. The significance the synthesizer plays in this story is the absolute consolidation and standardization of this form in disco music. For while most rock and jazz music can be heard with these characteristics, more progressive musicians of those genres often experimented with the limits of musical form. But with the development of popular electronic music such as disco and synthpop, these formal qualities became the standard, and rarely ever would musicians deviate from these qualities to create something truly groundbreaking and original.

One way in which the synthesizer could be seen as potentially hindering to a musician's originality, is the lack of variation of 'instruments' used from one synth musician to another, due to the heavy use of instrument presets among synth musicians. Now, this may be counterintuitive to what the synthesizer is, as the infinite possibility of sounds is inherent within the instrument's nature, but oftentimes synthesizer users will have less interest in programming their own sounds and would rather just purchase the instrument with the best preset sounds. In *Any Sound You Can Imagine: Making Music/Consuming Technology*, Paul Thèberge explains that "As far as the manufacturers were concerned, programmability was still important as a status symbol for any serious, professional synthesizer; but the ease of use and ready access to 'libraries' of exciting, prefabricated sounds would increasingly become the basis upon which new instruments were

marketed and sold" (1997, 76). Therefore, the entire purpose of the instrument, which is the ability to create any sound for the musician, is often voided due to the existence of preset sounds.

This is especially true with the emergence of electronic drum machines, such as the Roland TR-808 and TR-909 machines, released in the early 1980s. Although these machines were also programmable, musicians would have (and still do have) a tendency to just employ the already existing electronic drum sounds, due to their clean sound and established popularity among forms of popular music, including R&B and disco in the 70s and 80s, and decades later in contemporary hip-hop and electronic dance music. In addition to the tendency for producers to use preset sounds on a drum machine, preset rhythmic patterns on drum machines are also common, further eliminating the need for musical knowledge and "skills" in the traditional sense (Théberge 1997, 3-4).

Keeping in mind the frequent heavy use of presets for synthesizer musicians, it can be argued that there is less variation of sounds for electronic instrument musicians than musicians of more traditional electric and acoustic instruments. Orchestral instruments such as members of the woodwind and brass families can certainly vary in sound tone. Likewise, different electric guitars and basses might generate a softer or harder sound for instance. Drummers have numerous possibilities of drum sets to choose from, and many even create their own drum kit arrangement, with combinations of parts from different drum manufacturers. Not to mention the countless different brands of drum sticks available to the drummer and the different timbres they exhibit, especially when considering the infinite stick-drum combinations. Furthermore, it would be extremely difficult to tune two drum sets to one identical sound. Musicians of more traditional instruments have the option to improvise while performing live, articulating every note in any

way they desire; whereas today, the electronic music producer/ DJ is often criticized as a glorified presser of the "play" button.

The Synthesizer's Application in Music

Before the era of the electronic music producer, rock musicians were utilizing the electronic sound to compliment the band. In *Experimental and Electronic Music*, Thom Holmes claims that "Rock music is very much about crafting and shaping sounds, so it was only natural that many of the early adopters of electronic music techniques would be in the recording studio producing hit records" (2008, 408). In fact, before the synthesizer became commercially available to musicians everywhere, famous rock musicians were exploring another technique for electronic sound – tape manipulation. In 1966, the Beach Boys produced their song 'Good Vibrations' by using tape manipulations to achieve a rich, dense sound. Likewise the Beatles played recordings backwards and used tape loops in their songs 'I'm only Sleeping' and 'Tomorrow Never Knows,' both from the album *Revolver*. Prior to the synthesizer, other musicians such as the Velvet Underground, the Grateful Dead and Frank Zappa played a part in the development of electronic rock through studio techniques such as tape manipulation and the use of filters to control timbres (Griffiths 1979, 61-62).

In 1964, Robert Moog changed the game with his innovation, the Moog synthesizer:

> Robert Moog constructed the first sound devices responsive to voltage controls, a voltage-control oscillator and a voltage-control amplifier. Previously it had been necessary for a composer to 'tune' his equipment by hand in order to obtain the desired pitch, volume or whatever. Moog's inventions, which made it possible for this to be done by electronic signals, increased the speed and precision with which

> sounds could be created and at the same time paved the way towards the
> construction of an instrument for sound synthesis. (Griffiths 1979, 19)

With Moog's innovations in combination with the miniaturization of electronics taking place simultaneously, in 1966, the Moog synthesizer became commercially available to the public. Interestingly enough, it was Wendy Carlos and her work in 1968 in which she covered classical pieces of Johann Sebastian Bach on the Moog, titled *Switched on Bach*, which brought the instrument worldwide attention. It alerted rock and pop musicians alike of the synthesizers potential and "certainly from that year they began to assume an increasingly important role in…rock, in some cases ousting the electric guitar as the group's sound world" (Griffiths 1979, 63). Ironically, Busoni would argue whereas Carlos' work was confined to the limits of Wagnerian form in Bach's music, popular musicians who would follow suit in synthesizer experimentation were limited creatively by the new standard in form.

However, that is not to take away from the brilliance exhibited in the work of many progressive rock musicians utilizing the synthesizer of the late sixties and beyond. In 1967, before *Switched on Bach* was ever released, Micky Dolenz of The Monkees was one of the first to purchase a Moog synthesizer and that same year the band released the first album featuring a Moog in *Pisces, Aquarius, Capricorn & Jones Ltd*. (Lefcowitz 1989, 48). That same year, the title track of the Doors' 1967 album *Strange Days* also featured a Moog (Bob Moog Foundation). In 1971, *Emerson, Lake & Palmer* by Emerson, Lake & Palmer featured the Moog played by Keith Emerson and in song "Lucky Man" was one of the first hits in which the Moog was a featured solo instrument (Holmes 2008, 411). Later that year, Yes released *Fragile* which featured the Moog and other electronic keyboards and one year later in 1972, they released *Close to the Edge*, which like Emerson, Lake & Palmer, utilized the synth as a solo instrument

(Griffiths 1979, 64). In 1973, Pink Floyd's album *Dark Side of the Moon*, a renowned rock

classic, employs an ensemble of synthesizers. That same year, Elton John's *Goodbye Yellow*

Brick Road featured the ARP 2600, a synth produced in 1971 by Alan R. Pearlman, the same

instrument used to create the voice of R2-D2 in Star Wars (Vintage Synth). These are just some

examples of early synthesizer usage in rock & roll music. These pioneers paved the way for the

pop and dance music producers of the future to fully submerse themselves in the synthesizer

sound.

Well known disco artists of the later 1970s such as The Bee Gees, The Jackson 5, Gloria

Gaynor and Donna Summer (and her producer, Giorgio Moroder) trademarked the disco sound.

Artists like these were the precursor to pop music and synthpop, the electronic genre which

became prominent in the 1980s and directly led to future forms of electronic and dance music.

Synthpop artists such as Yellow Magic Orchestra, Gary Numan and Soft Cell utilized the

synthesizer as the main instrument for their music. Pop artists of the 80s like Madonna, Prince

and Michael Jackson were also redefining the music industry, on a massive global scale. Much

like synthesizer film composers, disco musicians were some of the first to abandon traditional

orchestration (guitar, bass, drums, etc.) and replace it with electronic instruments. The

synthesizer and the drum kit negated the need for any other instruments, and in this we have the

emergence of the modern music producer.

With the improvement of electronic instrument technology in music, the role of the music

producer was redefined. Broadly defined, a record producer traditionally oversees the recording

of an artist's music. That can mean many things, including coaching the artist, selecting songs,

controlling the recording sessions, mixing and mastering, and so on. As the development of

different forms of electronic music ensued, music producer virtually became synonymous with

music composer. Oftentimes, the record producer of the early days of pop music was entirely responsible for the actual composition of the instrumentals. Paul Thèberge writes of this shift in the role of the producer in *Any Sound You Can Imagine*: "In part because of the increasing importance of producers in the recording of popular music, there has been a tendency throughout the 1970s and '80s for producers to become as well known as the stars they record. This fame has become noteworthy throughout mainstream pop but especially in early disco and many subsequent genres of dance music" (1997, 219). The increasing importance of the producer that Thèberge mentions is a direct reflection of the qualities of the emerging world of electronic music. Today, a music production almost exclusively refers to the creation of electronic music and in most cases, producers are solo artists.

Advancements in Instrument Technology

Technological advancements in the field of electronic instruments since the 1980s such as the software synthesizer have led to an explosion of electronic music production. When the massive popularity of disco began to die out, the production of electronic music did not waver. Following disco and pop music, early forms of electronic dance music, or EDM, in the 1980s and 1990s such as house music, quickly branching off into acid house, techno, and trance, proved that the popularity of electronic music was still strong. Indeed, hip-hop, an offspring of disco, was another space for the electronic producer and the software synthesizer to thrive. Although hip-hop and electronic dance music are usually considered separate entities of music, we should consider them one in the same for the purpose of these arguments, due to the principal theme of the electronic producer.

Perhaps still today the most significant improvement to electronic music technology is Musical Instrument Digital Interface, or MIDI technology, introduced into the marketplace in 1983. A broad concept, in *Synthesizer Performance and Real-Time Techniques*, Jeff Pressings defines MIDI as "a universal serial communication protocol between electronic music devices of any kind…this simple protocol has now been adapted to control virtually every possible electronic musical device, and a flotilla of new products has sprung into being on the back of its versatility and universality…" (1992, 11). MIDI control connects electronic musical instruments, such as a keyboard, to a computer or any other possible electronic device. MIDI technology allows for the employment and manipulation of effects, filters, tempo changes, and so on by hand. As Pressings indicated, MIDI technology also contributed to the democratization of electronic music and equipment: "The degree of instrument compatibility required by the MIDI specification has created a horizontal integration of the synthesizer market" (Théberge 1997, 83-84).

Underground rave scenes such as warehouse parties as well as outdoor festivals proved to be a refuge for electronic music enthusiasts. The existence of these electronic music performances in combination with the exponentially expanding market for electronic music equipment, due to falling prices of equipment for manufacturers caused by improvements of microprocessor technology (which also improved manufacturing), led to a democratizing effect. The result was the home studio music producer.

In other words, constant improvements to electronic instrument technology of the 1980s and 90s brought about the trend of producers creating from their personal computers at home. Thom Holmes articulates that "The potential uses of electronic music have expanded exponentially through the availability of programs for making music with a personal computer.

Computers have become the hub around which other music production functions now orbit…software for creating, editing, and controlling electronic music is pervasive" (2008, 281). One might think that this widespread availability and equal access of electronic music equipment would lead to expanding musical creativity among electronic producers, and they would not be completely wrong, as new electronic music genres of the last decade are in abundance. However, although new genres of electronic music seem to arise by the day, producers of these "new forms" of electronic music are still utilizing the same general musical form that was present in rock & roll, R&B, funk, disco, and pop, in hip-hop or any genre of EDM.

Contemporary Electronic Music

The ability for anybody with access to a computer to create electronic music has certainly helped to contribute to the popularity of electronic music for producers and listeners alike. The software synthesizer made it nearly impossible to distinguish between the sounds of an amateur making music from his computer at home, and the music of more renowned producers: "The home studio has become both the site of significant musical activity at every level from professional to amateur music-making, the focal point for the consumer market for electronic musical instrument suppliers… as the home has increasingly become a technically viable sight of production, conflicts between the professional and amateur worlds of music making have come to the fore" (Thèberge 215). But unlike disco and pop music of the first electronic producers, in which the form employed was less of a reflection of creative deficiency, and more so just an effort (and successful one at that) of appealing to the masses through new sound, much music of contemporary electronic producers might be deemed as creatively lacking, largely in part due to the amateur producer lacking in basic knowledge of music theory and skill. The blurring of the lines between the professional and amateur that the democratization of electronic music brought

about has also led to a sentiment about the modern producer among electronic music enthusiasts and haters alike –the absence of any prior technical musical skill or knowledge for the EDM producer. Even with the implementation of MIDI technology, producers still were more concerned with mastering the technology to produce desired sounds rather than the learning and employment of basic music knowledge and skills: "The extension of digital control through MIDI to all aspects of sound creation, processing, sequencing, recording, and mixing has also altered the process of musical production for many musicians and called into question prior notions of musical skill" (Théberge 1997, 84). So once again, whereas MIDI control once again broadened the horizons for musical creativity, allowing for a kind of 'live' feel for the production, it is impossible to say if producers really ever utilized the technology's capabilities in an attempt to create something truly original. Instead, electronic music continued to trend towards the constant reimplementation and full-blown solidification of Western music form in the styles of hip-hop and EDM.

I should more clearly define the term EDM before moving on. The term is controversial in itself among electronic music supporters. The problem is that in the last decade or so, dozens of sub-genres of 90s house and techno have arisen from music producers, and by definition, EDM lumps all of those genres together. For example, the three genres of techno, moombahton and drum 'n' bass (although they do inhabit the same basic form, at different tempos), should never be lumped into a common group, simply due to their drastically different sounds. Although both forms of music are produced electronically, that is not enough to warrant grouping both genres into the same category. Likewise, you would not group the rock & roll and jazz together into one genre, calling them both sub-genres of the blues, simply because they often use the same instruments. Much like the same way in which the term EDM has over-simplified the way that

we view modern electronic music, it has likely also contributed to the over-simplification of production techniques from aspiring producers in recent years, due to the formal standards already set in place for the EDM track. For simplicity's sake, in this essay, I will be using the term EDM in its usual misunderstood way.

Although the tendency of electronic music producers to stick to the form could easily be viewed simply as an unwillingness to explore the limits of originality, we must not simply make the assumption that all electronic music producers lack creative integrity. Just like the Emerson, Lake & Palmers and Pink Floyds of the 1970s, utilizing the synthesizer and creating something progressive while keeping intact popular music form, a variety of electronic music producers of the 90s and 2000s have managed to break ground through the constant development of new deviations from already existing electronic music styles, all while not breaking from the same general musical form to ensure maximum resonance with listeners of electronically produced music.

The first hip-hop song is widely regarded as New Jersey-based Sugarhill Gang's "Rappers Delight" (Encyclopedia of New York State). Although this was not the first track to feature rapping, it was the first that received attention on a national scale. Following the epic single which introduced hip-hop to the world, other artists would soon follow in Sugarhill Gang's footprints, eventually making hip-hop-hop a genre of popular music. The Encyclopedia of New York State reveals a brief history of the emergence of a new genre:

> The first group to have significant critical and commercial appeal was Run DMC from Hollis (Queens Co), which released a nationally successful album in 1984. Middle class and well versed in hard rock, members Run (Joseph Simmons), DMC (Darryl McDaniels), and Jam Master Jay (Jason Mizell; killed in

2002) worked closely with New York University art student Rick Rubin to produce a hard-edged, guitar-heavy brand of hip hop. Following closely behind were the Beastie Boys, an all-white rap group that, using a formula similar to Run DMC's, sold millions of records and established the commercial viability of hip hop.

This new wave of music was regarded as the new school of hip-hop. Artists such as Run DMC and LL Cool J exemplified the new school, which predominately originated in New York City. This new form of hip-hop music was distinguished by a heavy presence of drum machines and an influence of rock music, all while keeping intact a minimalist approach for the producer. Artists of the new school made shorter songs with goals of achieving radio play, all revealing of the growing popularity and mainstream appeal of hip-hop music. Finally, in 1986, the Beastie Boys released the first rap album to hit number one on the Billboard charts, *License to Ill* (Stephen Erlewine, allmusic).

In 1990, Robert Hilburn of the LA Times comments on the increasing appeal of hip-hop music since its emergence:

> It was 10 years ago that the Sugarhill Gang's "Rapper's Delight" became the first rap single to enter the national Top 20. Who ever figured then that the music would even be around in 1990, much less produce attractions that would command as much pop attention as Public Enemy and N.W.A? "Rapper's Delight" was a novelty record that was considered by much of the pop community simply as a lightweight offshoot of disco—and that image stuck for years. Occasional records—including Grandmaster Flash's "The Message" in 1982 and Run-DMC's "It's Like That" in 1984—won critical approval, but rap, mostly, was dismissed as a passing fancy—too repetitious, too one dimensional. Yet rap didn't go away, and an explosion of energy and imagination in the late '80s leaves rap

today as arguably the most vital new street-oriented sound in pop since the birth of rock in the '50s.

Hilburn's comparison of hip-hop to rock, and more importantly his labeling of both genres as 'pop' music is ever so revealing of the connections of form between all types of popular music of the West.

Following the emergence of the new school, in the early 1990s the West Coast experienced the birth of gangsta-funk, or G-funk. Although most contemporary hip-hop is created with electronic music software, G-funk epitomized what the "synthesizer" sound was in hip-hop. G-funk music was typified by the multi-layering of synthesizers, but more importantly a high pitched portamento synth lead which listeners will often point to as simply "the synthesizer." G-funk helped contribute massively to the growing mainstream appeal of hip-hop music. The genre eventually receiving worldwide attention can be largely attributed to Los Angeles based producer/rapper Andre Romelle Young, better known as Dr. Dre. In *Rap Music and the Poetics of Identity*, Adam Krims characterizes G-Funk as "a style of generally West Coast rap whose musical tracks tend to deploy live instrumentation, heavy on bass and keyboards, with minimal, (sometimes no) sampling and often highly conventional harmonic progressions and harmonies. Dre's *The Chronic* (1992) serves as a milestone in G-funk…" (2000, 74). Whereas earlier hip-hop relied heavily on the use of sampling, such as "Rapper's Delight" sampling funky disco track, Chic's "Good Times," G-funk producers like Dre, while sometimes sampling lightly, created his music largely by making sounds of his own. Over two decades after his release of *The Chronic*, the album which brought G-funk to the world stage and solidified the popularity of hip-hop music, Dr. Dre has proven to be one of the most influential electronic producers of all time.

On the other end of the contemporary electronic music spectrum, French musicians Thomas Bangalter and Guy-Manuel de Homem-Christo, or Daft Punk, have likely contributed more to the development and popularity of electronic music than any other artist in recent decades. Daft Punk began making music in 1993 (Sean Cooper, allmusic), and in 1997 released their debut album, *Homework*, which brought them commercial success and more importantly, was one of the most influential electronic music albums of the nineties. The music of *Homework* would fall under the sub-genres of techno and house. In 2001, the release of their second and most successful album, *Discovery* initially shocked fans with its synthpop style. In 2005, their next release, *Human After All*, combined elements of rock and minimalism to their house music base. Their 2007 live album, called *Alive 2007*, incorporates music from all of their albums, but combines and redisplays their own sounds in a revolutionary way. In a review for Pitchfork.com, Ryan Dombal explains the live album's significance:

> One of the most remarkable aspects of *Alive 2007* is how well it recontextualizes career nadir *Human After All*, turning previously leaden songs into ebullient rock'n'roll manifestos; injected with *Homework*'s air-tight Moroder-style anthems or *Discovery*'s flamboyant funk, *Human After All* tracks are constantly improved and born anew. The live set doesn't simply run through the hits, mindlessly segueing from one smash to another. Instead, well-worn favorites are glued together, cut-up and mashed into pieces.

In 2010, Bangalter and de Homen Christo stepped out of their comfort zone to score Disney's remake of Lisberger's 1982 *Tron,* titled *Tron: Legacy* (2010) and in 2013, it was revealed that they would be collaborating with Giorgio Moroder, along with several other artists significant to the electronic dance movement, on their newest album, *Random Access Memories*, set to release in May 2013 (The Creators Project, 2013). In an interview with The Creators Project, Moroder speaks of Bangalter's and de Homen-Christo's extreme attention to sound

detail and compares it to his lack thereof when he was producing for Donna Summer. He claims

that he would try to find a sound on the vocoder and it would take him "maybe twenty minutes,

maybe an hour." In contrast, Bangalter and de Homen-Christo told him it would take them "a

week or so only to find the sound." Moroder recalls recently listening to a recording of his

production with Donna Summer, "Love to Love You Baby" (1975), and thinking that "in the

beginning the baseline is terrible. Daft Punk would not have let something like that go." Moroder

articulates that *Random Access Memories* will once again be a major landmark to electronic

dance music, perhaps a step back towards the days of the band. He states that instead of having

every sound come from "pushing a button or a chord," Daft Punk has incorporated guitars, bass,

drums, and so on for a full sound and human feel. For Moroder, "It's time to have something

new in the disco and dance world and this is like a step forward." (The Creators Project, 2013).

Connections and Conclusions

During the last century, music has undergone significant transformations. The era of modernism brought about an ideology of form in the arts becoming outdated, which naturally transferred to music. In 1907, Ferrucio Busoni's "Sketch for a New Esthetic of Music" exemplified this. Busoni protested traditional musical form and argued that composers who felt the need to stick to an already established form were restricted. He used Richard Wagner as the model composer for the limitations of traditional form, the same composer whose textbook form, yet emotional postromantic style would influence countless composers of traditional film scores in the twentieth century. Busoni experimented with electronic instruments, but the technology of his time was not advanced enough to allow for any sophisticated instruments. Edgard Varese, Busoni's principal student would also experiment with electronic instruments, and his fascination with noise would prove to have a lasting effect on film composers of the modern electronic score. Of course, the synthesizer would have to be invented before electronic film scores could truly thrive. But in the two directly contradictory film scoring styles of the traditional and the modern, a shift in music ideology can be observed. Due to the innate scarcity of form in film music (and electronic film music especially), Busoni might contend that the modern film score is the nearest musicians have come to a truly imaginative sound.

Whereas film music allowed for composers to exercise their skill and creativity to the fullest extent, inherent in the definition of popular music is the valuing of appealing to

the masses over musical skill and originality. The new form established in popular music may have restricted the musicians of early electronic and pop music creatively in the eyes of Busoni; nonetheless, artists still found ways to utilize the synthesizer in musically inventive ways and resonate with listeners everywhere.

Musicians influenced by Varese's sound were not just limited to film composers. In fact, oftentimes synthesizer musicians overlapped into both worlds of film and popular music. Giorgio Moroder composed electronic scores for films such as *Midnight Express* (1978) and *Metropolis* (Moroder version in 1984) and also produced for Donna Summer on numerous occasions in the disco era, the true period of the synthesizer's surfacing in popular music. Decades later, Moroder collaborated with the contemporary electronic music kings, Daft Punk in their 2013 album, Random Access Memories. Another collaborator with Daft Punk on that same album is Nile Rodgers, who composed disco artist Chic's song "Good Times," the main song sampled in Sugarhill Gang's "Rapper's Delight," the first hip-hop track. In 2010, Daft Punk scored the remake of the original film *Tron,* which was scored by Wendy Carlos, the same musician who brought the synthesizer worldwide attention in the first place with her release of Switched on Bach in 1968. These are just a few examples of the correlations between film and electronic music, and the interconnections within electronic music itself. With the synthesizer's invention and technological advancements in electronic instrument software, the world of music was revolutionized and the role of the producer was redefined.

One association that can be made from observing the world of electronic sounds is the seeming trend in the pairing of electronic sounds with a visual accompaniment. We see this obviously in film and television's use of the synthesizer in electronic scoring, but also in the emergence of the music video in the 1980s, a major component of pop music. Today, music

videos produced by contemporary electronic artists are often a space for more progressive music

video narratives. This can be attributed to the fact that a traditional music video format will often

focus on showing artists performing their music, and footage of an electronic music producer

making music on a computer will not suffice as entertainment in the eyes of most. In addition to

electronic music videos, as well as film and television scoring, video games are almost

exclusively scored electronically, or at least they used to be before the development of complex

narrative games in recent years, ever more revealing the electronic visual-aural correlation.

Since the Beatles used the synthesizer in songs such as 'A Day in the Life' and 'Tomorrow

Never Knows,' songs which speak of experiences with hallucinogenic drugs (Griffiths 61), there

has been a loose association with electronic music and drug culture, something which can be

seen in the 1990s with the development of raves and rave culture. In *The Electronic Arts of

Sound and Light*, Robert Pellegrino writes that "Because electronic instruments extend not only

our sensory modes but our central nervous systems as well, they are bound to affect the very

essence of our beings" (Pellegrino vii). Thus, perhaps there is no better space than electronic

music for artists to attempt to relay a kind of pseudo-psychedelic experience through their

productions. Today, electronic artists perform accompanied with massive, elaborate stage

lighting, contributing ever so much more to the notion of the natural pairing of electronic sounds

and a visual stimulant. Pellegrino points out that "Laser scanning systems along with video… are

logical visual extensions of electronic music instrumentation and its associated thought

processes… [Lighting] can be coupled with a synthesizer or computer in the same direct fashion

as loudspeakers; its operation is real time" (Pellegrino 177).

Whether or not you believe that the consistent music form found in modern electronic

music restricts and inhibits a musician's originality, one thing about electronic music can be

observed. This is the integration of music genres and the development of an overall more open-minded and musically tolerant listening culture. Although synthesizer music of the 70s and 80s was often still popular music, it did not resonate with many, as the music world was still segregated into two general worlds – rock and electronic. Thomas Bangalter explains this dilemma of the past and how Daft Punk attempts to counteract it with their music:

> Our music has always been a mixture: as much influenced by disco bands like Chic as by AC/DC. Music was segregated in the '80s, and then in the '90s the boundaries started to break down and rock kids got into electronic music. But then you got this reverse snobbery where people would only listen to electronic music and not rock. So we were always trying to fight this, to make music outside the establishment. For this generation, I think it is natural to like everything. But it was never like that for us.

Bangalter mentions how the current generation of music listeners is more likely than listeners of the past to accept music of several genres. This can be largely attributed to electronic music becoming more and more mainstream over time, proof being the everyday collaboration of rock and electronic artists, as well as major pop radio artists incorporating a heavily electronic sound. In short, since the invention of the synthesizer, electronic sounds have slowly permeated music more and more, and over time, the electronic sound became more naturalized in music. Today, the electronic music producer is the dominating force in the music industry.

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