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THE APPLICATION OF ELECTROACOUSTIC TECHNIQUES IN MUSICAL COMPOSITION

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Abstract
Composing music has long been a way for artists to express their emotions through sound. Composers are now able to manipulate and shape sound in ways never before possible, thanks to the introduction of electronic music. This study discussed the application of electroacoustic techniques in musical composition. This study aims to make those natural sounds that are not possible to notate through the musical software like the Finale or Sibelius etc., possible in musical composition. The study shall solve the problem of deficiency in exploring musical compositional techniques and spur composers to explore other techniques in musical composition. This paper uses qualitative research methods to gather data through the review of related literature and practical exercise of collecting natural sounds like the sound of rain and thunder etc, through careful observation of the weather forecast to generate the materials to use for this music. Findings show that electro-acoustic music is sound in electronic audio or audio-visual form. Is it not a composition that is heard vocally in practical performance like other types of musical composition? more so, composers who intend to engage in electro-acoustic musical composition must have the necessary apps like digital audio workstations (DAWs), MIDI programming, audio processing, and specialization techniques must be mastered by composers due to the technical difficulty of integrating and synchronizing electronic elements with acoustic instruments. The paper concludes that electro-acoustic musical composition should be greatly mastered by composers to create a natural interpretation of music where applicable.

Keywords: *Application, Electroacoustic, Techniques Musical Composition.*

INTRODUCTION

Musical composition comes in different forms with the application of different techniques. The unique thing about any of these compositional techniques or styles in which music is composed is that at, the end of the day, a musical composition is formed. The production of music requires the utilization of a variety of musical notes. These musical notes can be crafted by a composer straightforwardly or intricately, depending on the style of the piece.

According to Welch, Biasutti, MacRitchie, McPherson & Himonides (2020), Music has been vital to human culture and society for ages. It is a kind of artistic expression that combines sound and rhythm to convey feelings, ideas, and thoughts. There are numerous ways to create music, including singing, playing instruments, and composing. Composing music is the process of creating a musical work, from the initial concept to the finished product. Composing music is a complex process that requires both technical and aesthetic abilities. Composers must have an in-depth knowledge of music theory and the capacity to produce and manipulate musical components including melody, harmony, rhythm, and texture. They must also be able to successfully explain their thoughts and use their creativity to realize their musical vision. Many aspects of music composition have been investigated through research studies (p. 1).

Lisboa, Chaffin & Logan (2011) investigated "the creative processes involved in music composition. The researchers discovered that composers use a combination of intuitive and intellectual strategies and that the creative process is highly personalized" (p. 12). The study of music and musical composition has significant implications for our knowledge of human creativity, emotion, and cognition.

Electroacoustic music composition is a field of study that investigates the use of technology to create and manipulate sound. It blends electronic and acoustic instruments to create music combining traditional and modern components. This subject has drawn considerable interest in recent years because of the growth of digital audio workstations and the development of novel sound manipulation techniques. According to Collins (2012), Electroacoustic music "refers to music that uses technology in the creation and/or performance of the music, and that typically includes both electronic and acoustic sounds." This genre of music is distinguished by its capacity to modify and manipulate sounds in a manner not conceivable with traditional acoustic instruments alone. Composing electroacoustic music requires the use of digital audio workstations, software synthesizers, and other electronic instruments for the creation and manipulation of sounds. The use of electroacoustic techniques in music composition has provided composers with new and intriguing opportunities. Composers, for instance, may now produce sounds that were previously difficult to generate with conventional instruments. Users can also manipulate sounds in real time, allowing them to create compositions that are distinctive and dynamic. The combination of live performance and electronic sound is a subject of significant interest in electroacoustic music composition. This integration provides new options for musicians to connect with technology and for composers to investigate the boundaries between traditional and contemporary music (p. 8).

The study of music composition employing electroacoustic techniques offers a novel and fascinating approach to the creation of music. It mixes the depth of acoustic instruments with the versatility and invention of electronic music. As technology continues to develop, the possibilities for electroacoustic music creation will undoubtedly expand and evolve.

PROBLEM

The musical software (Finale, Sibelius, etc.,) is limited to notate sounds that are not musical, however, are used in music as a form of expression. Among these numerous sounds are shouts, claps, animal sounds, and some natural sounds like rainfall, thunderstorms, and strikes. The use of electroacoustic is therefore employed to capture these sounds by a composer(s) and transmit them to digital music. This study discusses the application of these electroacoustic techniques in musical composition.

Aim

This study aims to make those natural sounds that are not possible to notate through the musical software like the Finale or Sibelius etc., possible in musical composition.

METHODOLOGY

The qualitative research method is used to gather data through the review of relative literature, and observation. The authors did practical work of recording some natural sounds like that of the rain, and thunder strikes with phones for application. The authors also discussed and created a musical composition with electro-acoustic techniques as a reflection of the discussion of this paper.

CONCEPTUAL CLARIFICATION

Electroacoustic

Electroacoustic techniques refer to the use of electronic technology to manipulate sound, often in the context of music or sound art. The techniques encompass a wide range of approaches, from recording and processing sounds to synthesizing new ones, and from live performance to installation works. Emmerson & Smalley (2001) discuss that:

Electroacoustic music is generally regarded as a body of art-music genres that evolved from compositional techniques and aesthetic approaches developed in Europe, Japan, and America in the 1950s. During this decade the growing availability of magnetic tape offered composers a high-quality recording medium which allowed greater experimentation in the manipulation of recorded sounds. This music sought to expand compositional resources beyond the sounds available from instruments and voices, to explore new sound shapes and timbres both by transforming recorded sources and by synthesizing new sounds and to break the confines of fixed pitch and metrically-based approaches to rhythm. The invention of sound recording has made all sounds available for potential use as musical material: sounds that were previously ephemeral can be captured, and environmental phenomena can be imported into music. Moreover, close exploration of sounding bodies (including instruments) with microphones magnifies and reveals the internal detail of sounds, sometimes with surprising results. Sound recording is itself a transformation process, and recorded sounds may appear in a work without further alteration. Alternatively, recorded sounds can be subjected to transformations ranging from lightly enhanced colorations to alterations so extensive that the transformed sound is but a distant relative of the original. For example, a sound can be analyzed into its constituent components, which can then be reconfigured, so that timbre and shape are transformed (p. 1).

According to Emmerson (2007), “Synthesis and sampling allow composers to work with sounds that are not bound by the physical limitations of acoustic instruments” (p. 39). According to research carried out by de Poli (1983).

The process of sound synthesis may be broken down into two primary categories: additive synthesis and subtractive synthesis. In subtractive synthesis, one begins with a complicated waveform and then filters away frequencies that aren't wanted to produce the desired sound. This method is frequently utilized in analog synthesizers and can produce sounds that are both warm and rich (p.10). Additive synthesis, on the other hand, entails beginning with simple waveforms like sine waves and adding them together to generate more complex sounds. Sine waves are an example of a simple waveform. This method is frequently implemented in digital synthesizers because of its ability to generate a wide variety of tones and sounds (p. 14).

Sound processing is the modification of audio signals for a variety of reasons, including recording, mixing, editing, and sound production. Among the various sound processing techniques are equalization, compression, reverb, delay, and modulation. These approaches can be applied to a variety of audio sources, including music, voice, and sound effects, to improve their quality and provide the listener with a more immersive audio experience.

As noted by Smalley (1997), “Sound recording and processing allow composers to work with sounds in a way that is fundamentally different from traditional music notation, as they can manipulate individual sound events rather than pre-existing musical structures” (p. 107).

According to Reiss (2011), the technological advancements that have been made in sound processing in recent times have provided a significant boost to the field of current music creation. The manipulation of sound waves to produce new sounds or to improve the quality of sounds that already exist is referred to as "sound processing." Equalization, compression, reverb, delay, and distortion are just a few of the many types of sound processing techniques that can be utilized in the production of musical works. Equalization, most commonly abbreviated to EQ, is a sort of sound processing that is quite widespread. Adjusting the relative weighting of a sound's various frequency ranges is a necessary step in this process. For instance, if a recording has an excessive amount of bass, an equalizer can be used to cut back on the low frequencies and produce a more balanced sound. Equalization (EQ) is an essential piece of equipment for the production of music and is utilized in virtually every facet of sound engineering (p. 3).

According to Feller (2018), EQ can be used to adjust the tone of an audio recording, such as to emphasize the bass or treble frequencies, reduce unwanted noise, or adjust to the recording environment's acoustics. Music, speech, and sound effects are all examples of audio sources that can benefit from EQ (p. 83).

From the above citations, the author views equalization as a strong tool in sound processing that provides exact control over the balance of different frequencies within an audio stream. This is made possible by the fact that equalization is a parametric tool. Recording, mixing, and mastering audio all need the use of vital tools, and equalization (EQ) is one of those tools. Equalization can be employed for either corrective or artistic objectives. In the field of sound processing, compression is a method that is frequently utilized that serves to bring the loudness levels of an audio source into a more consistent range.

Electroacoustic Techniques

Electroacoustic techniques encompass a wide range of methods for manipulating and transforming sounds, both acoustic and electronic. These techniques have opened up new creative possibilities for composers and performers, leading to the development of diverse styles and genres within electroacoustic music.

Electroacoustic Techniques

Electroacoustic techniques can be broadly categorized into the following:

Sound Recording and Manipulation: According to Roads (2001), “sound recording and manipulation involves capturing acoustic sounds using microphones and manipulating them through various processes like editing, filtering, and spatialization. Tape music, a subgenre of electroacoustic music, utilizes magnetic tape recorders to manipulate pre-recorded sounds” (p. 45).

Sound Synthesis: Dodge & Jerse (1997) believes that “sound synthesis refers to the creation of sounds using electronic devices or software. Synthesis techniques include subtractive, additive, frequency modulation (FM), granular, and physical modeling synthesis” (pp. 123-156).

Signal Processing: Roads (2001) holds the view that “signal processing involves modifying the characteristics of sounds, such as amplitude, frequency, and timbre, using effects like reverb, delay, chorus, and distortion” (p. 78).

Live Electronics: Wishart (1996) firmly believes that “live electronics involves real-time processing of sounds during a performance using electronic devices or software. This technique allows for improvisation and interaction between performers and technology (p. 98).

Computer Music: Roads (2001) subscribes to the idea that "computer music involves using computers for sound generation, manipulation, and composition. Software like Max/MSP, SuperCollider, and Csound are commonly used for creating computer music (p. 112).

Electroacoustic Techniques in Musical Compositions

Electroacoustic techniques have significantly expanded the sonic palette available to composers. These techniques enable the creation of new sounds, textures, and structures that were previously unimaginable. Composers can manipulate acoustic sounds to create otherworldly sonic landscapes or generate entirely new sounds through synthesis. Some specific applications include:

Creating New Timbres: Emmerson (2007) believes that "composers can use synthesis techniques to create unique timbres that do not exist in nature or modify existing sounds to achieve novel sonic textures" (p. 65).

Extending the Range of Instruments: Emmerson (2007) holds the view that "Electroacoustic techniques can be used to extend the range and capabilities of traditional acoustic instruments, creating new possibilities for expression and performance" (p. 89).

Developing New Forms and Structures: Roads (2001) asserts that "Electroacoustic techniques can be used to create new musical forms and structures that are not bound by traditional conventions. For example, granular synthesis can be used to create evolving soundscapes that unfold over time" (p. 134).

Integrating Technology and Performance: Wishart (1996) is convinced that "Live electronics can be used to create interactive performances where musicians and technology respond to each other in real-time" (p. 101).

How Applied Electroacoustic Techniques in Music Composition Will Be Heard

The way electroacoustic techniques are heard depends on several factors, including:

The Performance Space: Emmerson (2007) subscribes to the idea that "Electroacoustic music can be performed in traditional concert halls, but it is also well-suited for alternative spaces like galleries, museums, and outdoor environments" (p. 123).

The Sound System: Roads (2001) is convinced that "the quality and configuration of the sound system significantly impact the listening experience. Multi-channel systems can create immersive sonic environments" (p. 156).

The Listener's Expectations: According to Emmerson (2007), Listeners familiar with traditional acoustic music may need to adjust their expectations when encountering electroacoustic music. Openness to new sonic experiences is key to appreciating the full potential of this genre" (p. 145).

Electroacoustic music offers a rich and diverse listening experience. The combination of acoustic and electronic sounds, coupled with the innovative use of technology, creates a sonic landscape that is familiar and unfamiliar, challenging and rewarding.

THEORETICAL FRAMEWORK

The following theoretical components provide the framework for comprehending and analyzing the application of these techniques within the genre of traditional oratorio:

Creativity Systems Theory

Mihaly Csikszentmihalyi's "Creative Systems Theory" is one of the proposed theories within the field of musical creativity. The Creative Systems Theory offers insight into the psychological processes and environmental factors that contribute to the emergence of musical creativity. This theory was propounded by Mihaly Csikszentmihalyi (1996). Csikszentmihalyi's theory (1996) says:

- Creativity is not solely a product of individual genius but rather a complex interplay between the individual, the domain of expertise (in this case, music), and the sociocultural context in which creativity occurs. It emphasizes the dynamic and interactive nature of creative processes, highlighting the role of both internal and external factors (p. 109).

Csikszentmihalyi goes further to discuss the three components that influence music creativity:

Individual: The individual is the composer, musician, or other creator who is making music. Creativity in music has a lot to do with personality traits, cognitive skills, and internal drive. Csikszentmihalyi talks about the value of "flow," a state of deep immersion and focused attention, as a way for music to inspire creativity.

Domain: The information, skills, and techniques that are unique to music. It includes knowing about music theory, being good at playing an instrument, being familiar with different kinds of music, and being able to try out different ways of writing music. Mastering the topic gives you a base for exploring and expressing your creativity.

Field: The term "field" refers to the social and cultural setting in which music is made. It includes the musical community, organizations, technologies, and cultural norms and values. Collaboration, feedback from peers

and teachers, and hearing different kinds of music all help people come up with new ideas and ways of doing things (p. 114).

The authors believe that Creative Systems Theory gives useful insights into the complicated nature of music creation by showing how individuals, domains, and sociocultural contexts interact in many different ways. It helps people understand and encourage creativity in music. This lets artists and composers push the limits of artistic expression and add to the constantly changing landscape of music.

The Theory of Semiotics

According to Barthes (1964), Semiotics is a theory that is very useful for analyzing and understanding electroacoustic music. Ferdinand de Saussure, a linguist, came up with the Theory of Semiotics in 1916. Later, scholars like Charles Peirce and Roland Barthes added to it. Semiotics is the study of signs and symbols and how they are interpreted and mean something in a certain situation (p. 9).

Barthes (1964) goes further to discuss the theory of semiotics as it relates to electroacoustic music:

In the field of electroacoustic music, semiotics gives us a way to look at the signs and symbols in the sounds and how they relate to what they mean. It recognizes that sound itself can be seen as a sign that has meaning based on culture and time. The theory lets us look at how sounds are formed, how they are put together, and the listener's interpretation. There are different ways to look at semiotics in electroacoustic music. At the most basic level, it means recognizing and figuring out what each sound means as a sign. Each sound has its traits and can have cultural associations that add to what it means. For instance, a sound with a high pitch may be associated with tension or alarm, while a sound with a low pitch may give the impression of depth or darkness. In electroacoustic music, semiotics also includes looking at the larger cultural, social, and historical contexts that shape what the music means. The way people understand and view music can be affected by cultural references, genre conventions, and what they expect from the music. Semiotics can also be used to look at the link between electroacoustic music and other types of art, like visual arts or dance since they often interact and cross over in multimedia performances (pp. 10 - 12).

The authors believe that the theory of semiotics gives us a good way to look at electroacoustic music and figure out what it means. By looking at the signs and symbols in the sounds, how they are put together, and how they fit into the larger cultural context, one can learn more about the aesthetic, artistic, and communicative aspects of this genre.

The review also goes into the theory behind electroacoustic music, looking at things like sound synthesis, spatialization, and how electronic and acoustic parts work together. The authors do a good job of getting through complicated theoretical talks and explaining key ideas in a way that people from different backgrounds can understand. In addition to academic sources, the review includes artistic examples and case studies to show how electroacoustic methods can be used in musical composition. These examples help bridge the gap between theory and practice by showing what can be done and what problems can arise when electronic sound manipulation is added to a standard oratorio.

CONCLUSION

Composing music using electroacoustic techniques involves the utilization of electronic and digital technologies. The majority, if not all, of today's music, must have undergone electroacoustic processes. This emphasizes the significance of employing electroacoustic techniques in all of our musical compositions. This is what the authors discovered about electroacoustic music composition. Electroacoustic music can be created with electronic and digital instruments, such as synthesizers, samplers, computers, and audio processors. One of the defining characteristics of electroacoustic music is the innovative manipulation, transformation, and combination of recorded sounds to create new sonic textures and structures. Numerous electroacoustic composers employ musique concrète, a technique that involves manipulating recorded noises to create new musical material. As digital technologies continue to develop, the compositional possibilities for electroacoustic music are expanding, and this genre will likely continue to develop and influence the broader musical landscape.

SUMMARY

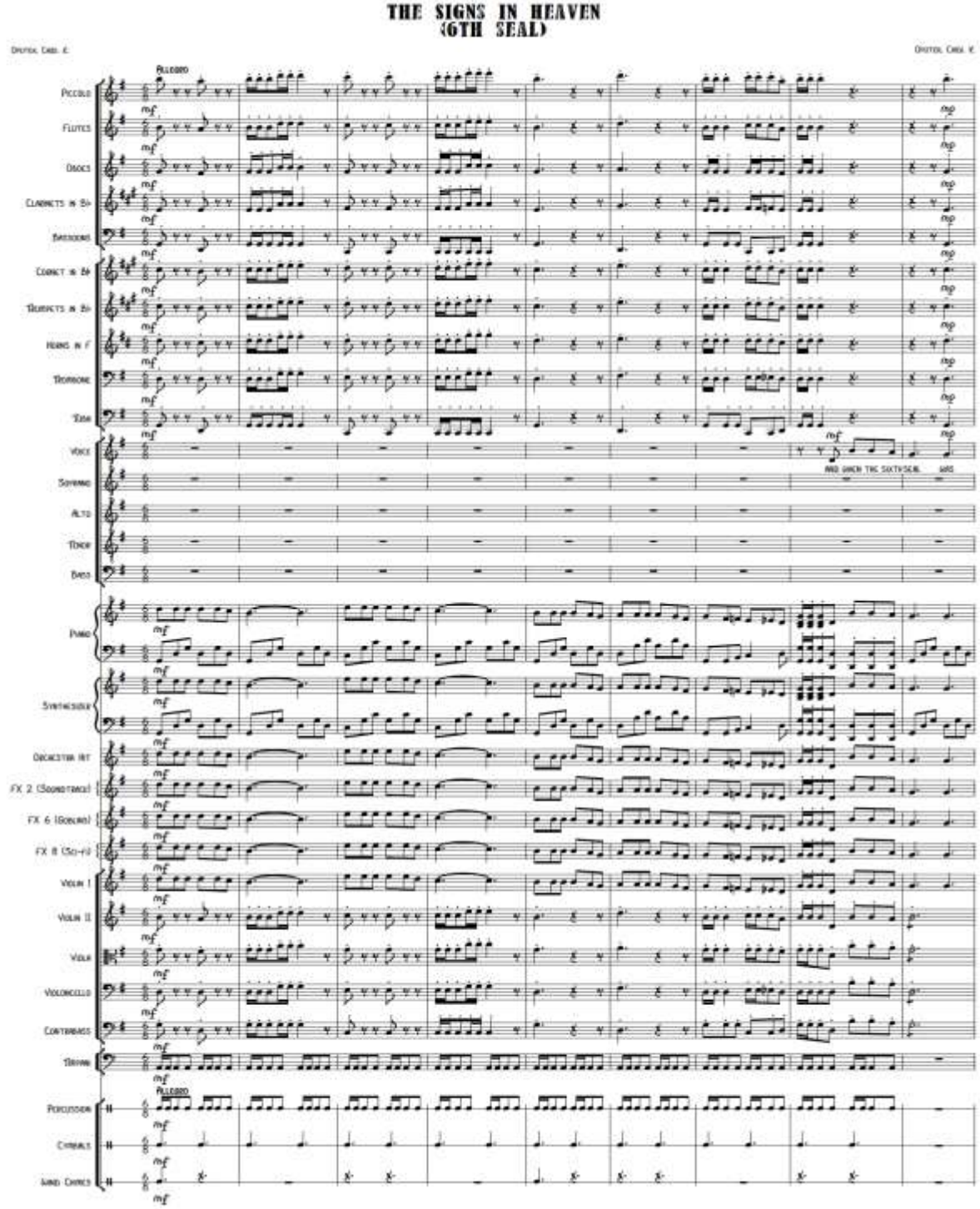
Composing music using electroacoustic techniques involves the utilization of electronic and digital technologies. The majority, if not all, of today's music, must have undergone electroacoustic processes. This emphasizes the significance of employing electroacoustic techniques in all of our musical compositions. This is what the authors discovered about electroacoustic music composition.

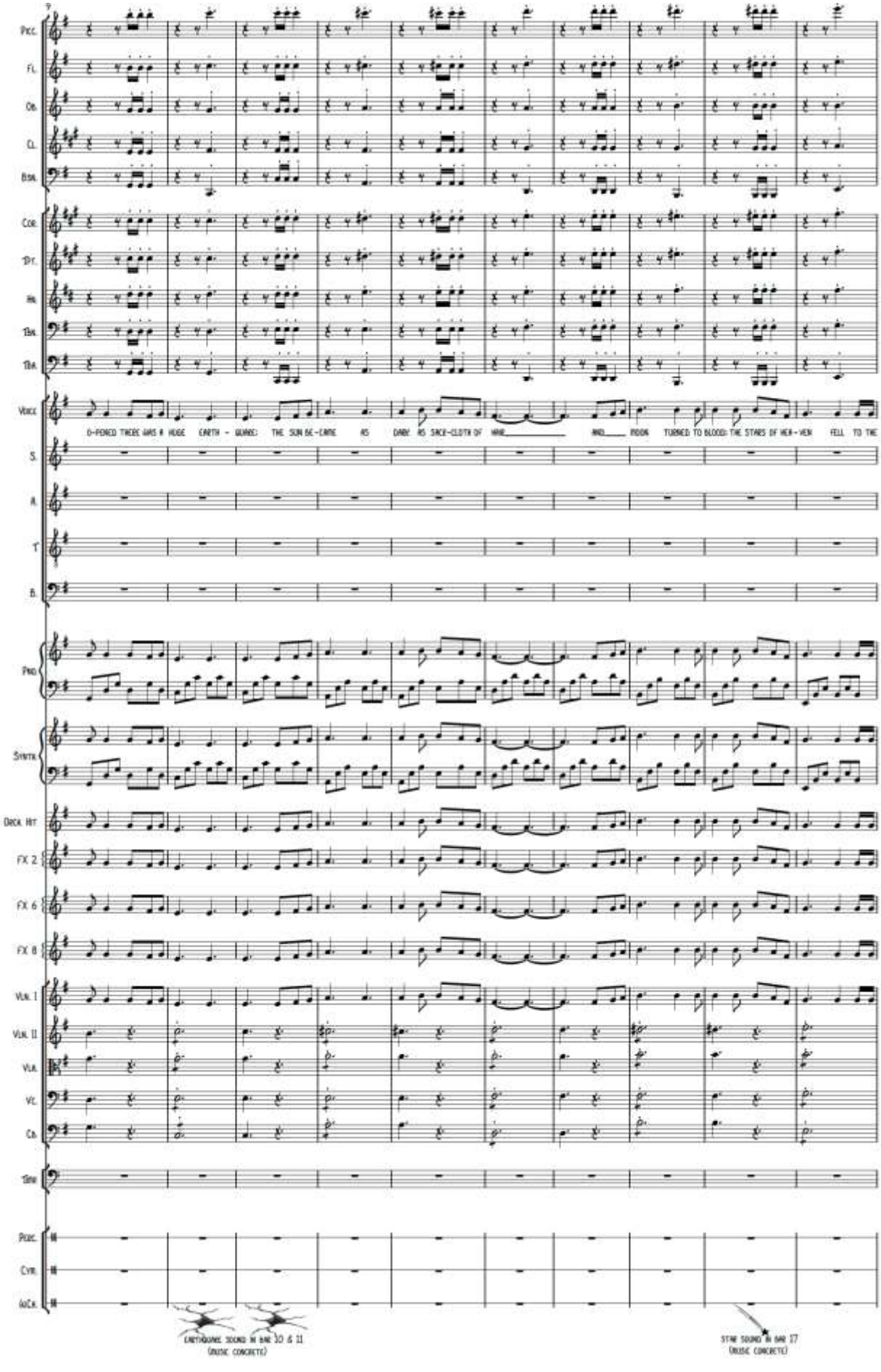
Electroacoustic music can be created with several electronic and digital instruments, such as synthesizers, samplers, computers, and audio processors.

One of the defining characteristics of electroacoustic music is the innovative manipulation, transformation, and combination of recorded sounds to create new sonic textures and structures.

Numerous electroacoustic composers employ musique concrète, a technique that involves manipulating recorded noises to create new musical material.

As digital technologies continue to develop, the compositional possibilities for electroacoustic music are expanding, and this genre will likely continue to develop and influence the broader musical landscape.

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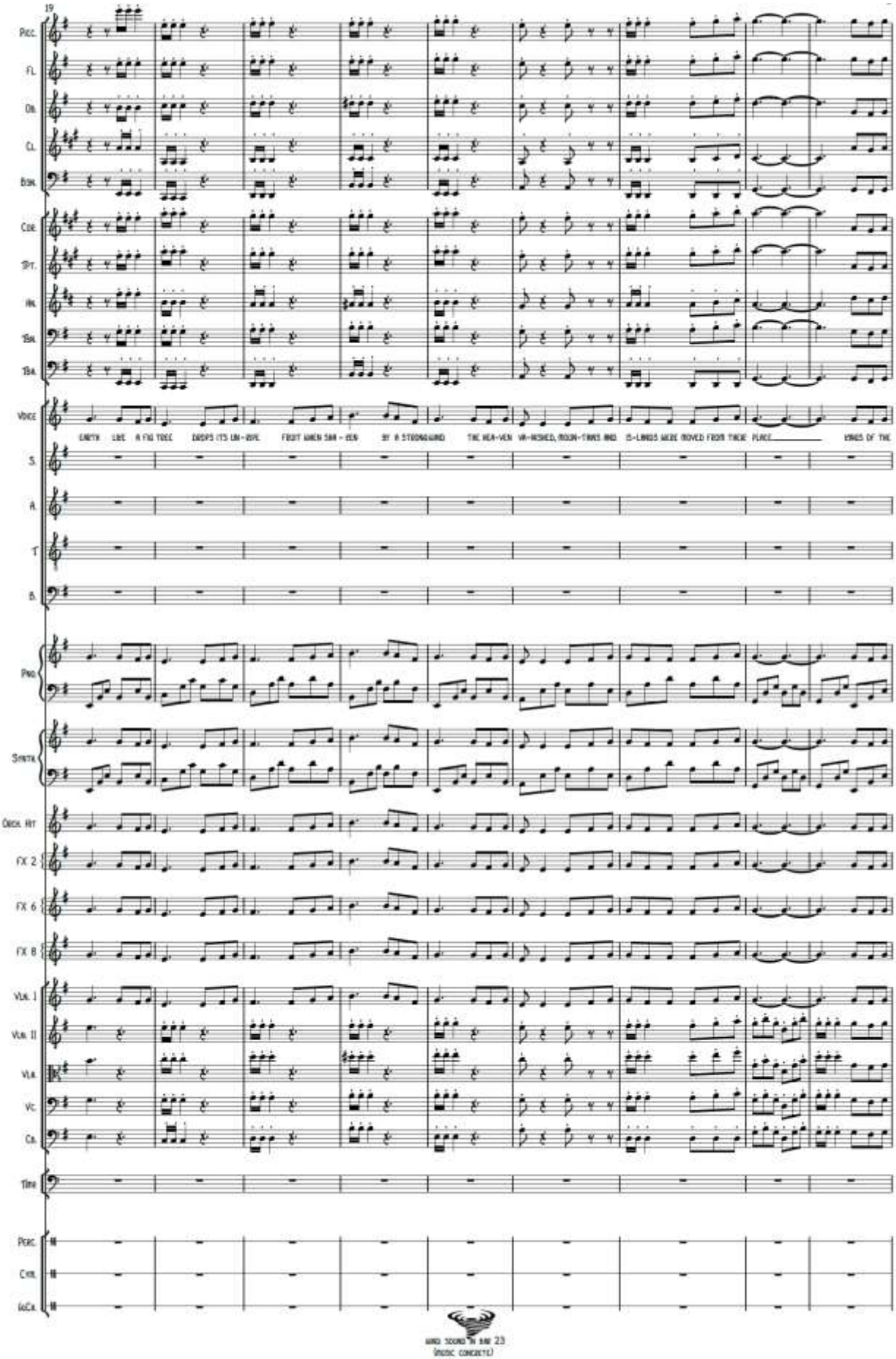
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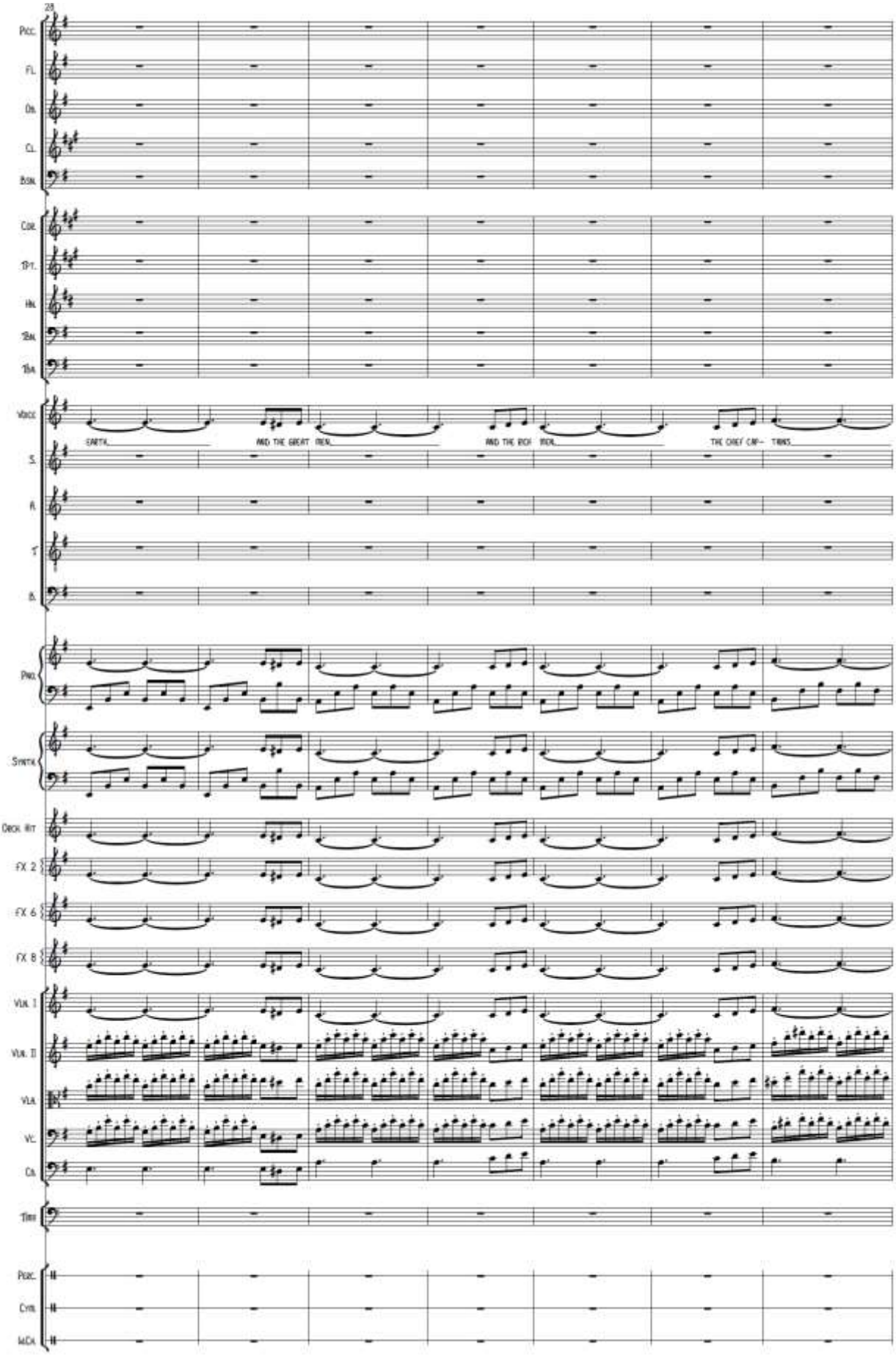
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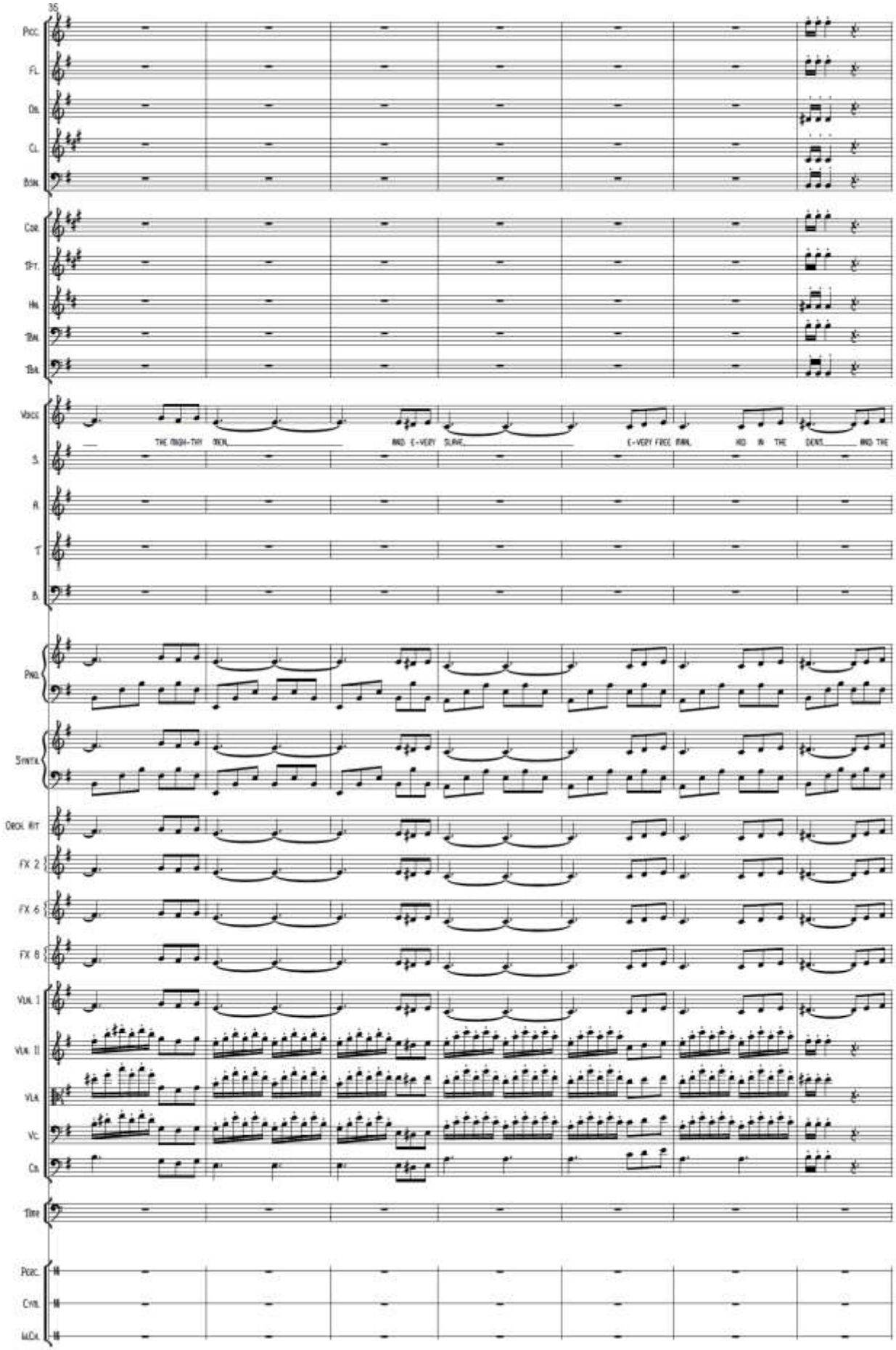
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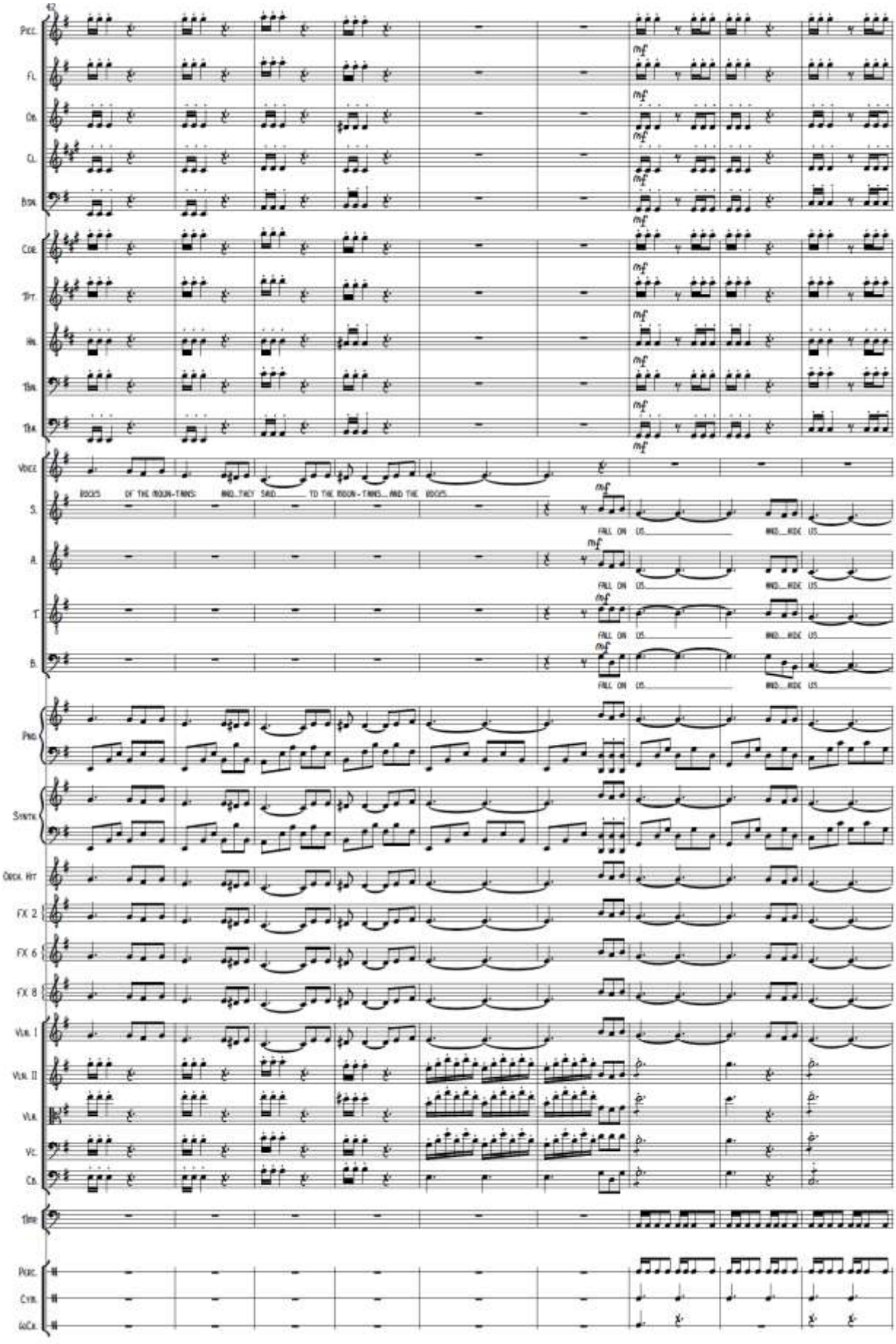
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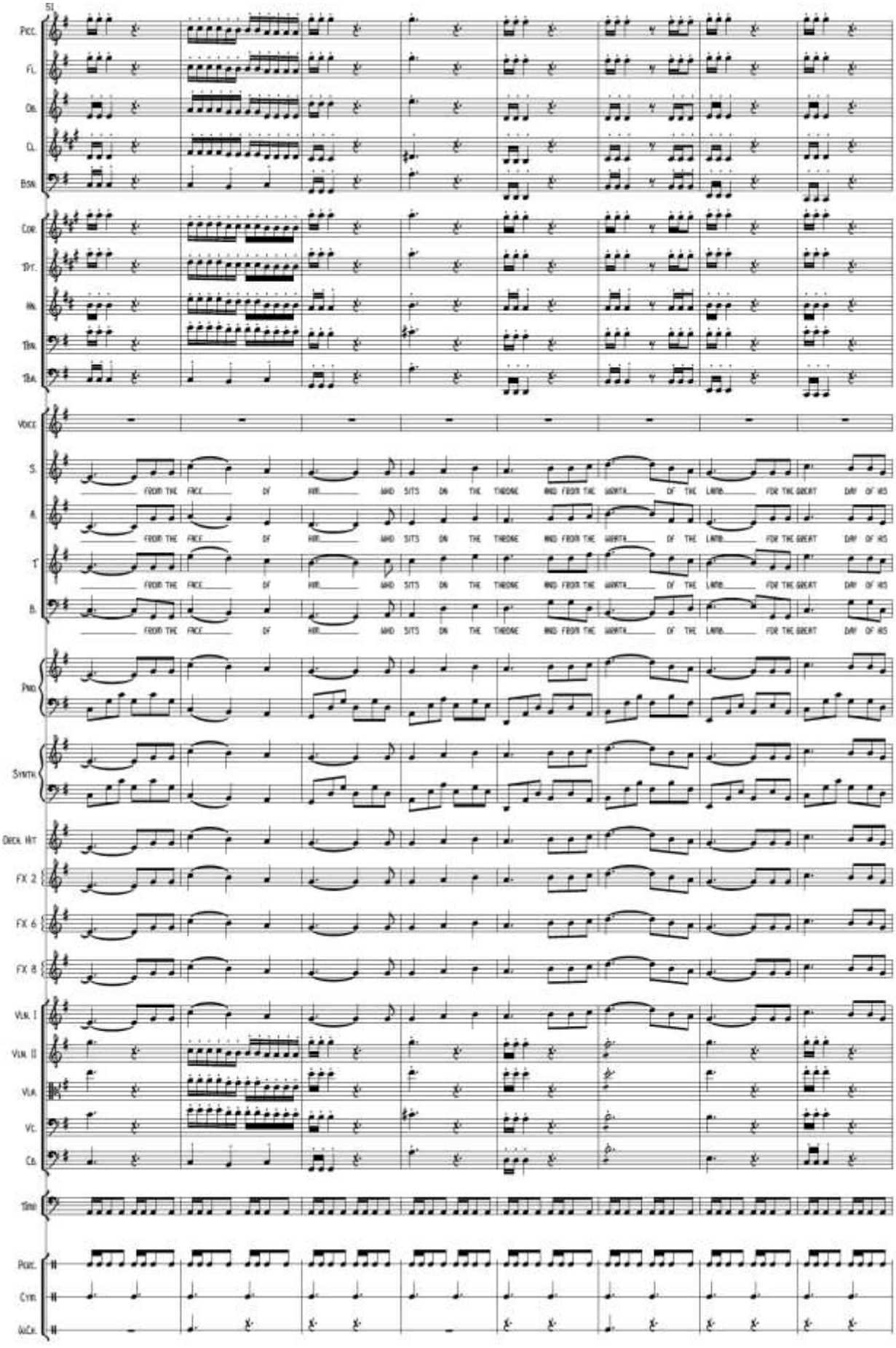
FALL ON US..... AND... RIDE US.....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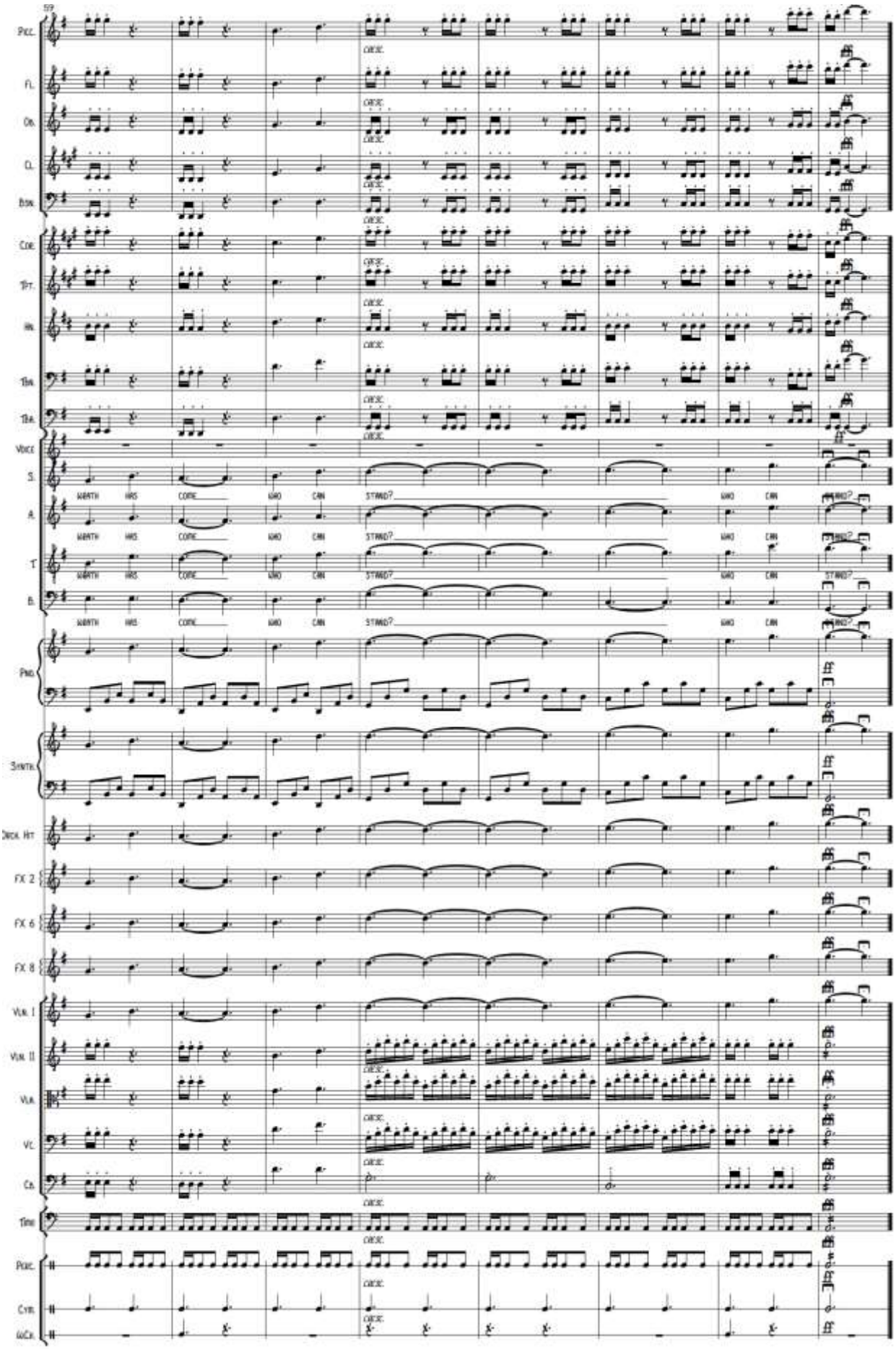
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WORTH HIS CORE WHO CAN STAND?
cresc.

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