Electronics and the Music of Miles Davis

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Electronics and the Music of Miles Davis

by

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Submitted in partial fulfillment
of the requirements for the degree of
Master of Arts Music Theory, Hunter College
The City University of New York

2018

Thesis Sponsor:

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I would like to thank Professors L. Poundie Burstein and Catherine Coppola for their help and guidance throughout my pursuit of a master’s degree, and for their assistance in reviewing this project.

Additionally, I would like to thank Prof. David Pearson, who provided valuable feedback and guidance in writing the initial paper that would become this thesis.
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Chapter 1

Introduction

From the late 1960s until his death in 1991, Miles Davis produced a sizeable catalogue of music relying on the use of electronic instruments and new technology. With their adoption, the famous trumpeter began what is commonly referred to as his “electric” period. The music Miles Davis made from the late 1960s on would either have been fundamentally different or altogether not producible without electronic equipment. Examining the electric period of Davis’s career helps us trace the profound impact of electronic instruments and technological advances on his music, suggesting ways in which Davis gleaned new methods of creating music prompted by these new technologies.

Not surprisingly, there is a wealth of criticism, scholarship, and discussion surrounding the music of Miles Davis. To be sure, there is an unfortunate tendency among some writers to gloss over or even outright dismiss Davis’s electric period.¹ This perhaps is due to its strange qualities and its unprecedented blurring of genres, styles and traditions. However, writers such as Philip Freeman² and Paul Tingen have written extensively about Davis’s electronic music. Tingen’s book Miles Beyond: Electric


*Explorations of Miles Davis*, in particular, is rigorously researched and filled with illuminating interviews, providing an excellent launching point for the present discussion.³

Even with these contributions, there remains much room for analysis and questioning of how Davis’s electric music was shaped by contemporary trends and emerging technologies that utilized electrical energy. The uniqueness and fascinating qualities of Davis’s music from this era makes these topics worth exploring. I intend to build off of the work of Tingen and other writers, detailing the particular ways technology shaped Davis’s music and what the implications of this may be. I also discuss the music resulting from Davis’s interest in electronic sounds, some of its theoretical aspects, and its relationship to ideas of chaos theory and the interaction of complex systems as discussed by writer, musician, and teacher David Borgo. Among the topics I address are ways in which new technological possibilities may have interacted with and shaped Davis’s very conception of how music can be made, what possibilities may have been suggested to him by adopting electronic instruments, and the give and take between musicians generally and the technology of their time.

The impetus to write about this topic comes from a place of deep personal interest. First hearing Davis’s electric work as a teenager, I was in awe of this music that sounded incredibly enthralling while at the same time complex and disorienting. I could not conceive of how the music was made. As a young musician, to hear something so alien was consciousness altering and inspirational. I was already familiar with

groundbreaking but more traditional Miles Davis albums such as *Birth of the Cool*, *Kind of Blue*, and *Sketches of Spain*. Each album traversed new terrain, yet few people would argue they were not essentially jazz music, or a type of orchestral jazz in the case of *Sketches of Spain*.

When I purchased *Bitches Brew*, my first electric Miles Davis album, I had no idea what I was in for. The psychedelic cover art was the first indication that the music would not sound like *Kind of Blue*. My subsequent years-long discovery and understanding of how the music came about was seminal for me as a musician, as it would be for countless others. Many of the methods used by Davis on *Bitches Brew* are to this day adopted by myself and other musicians of diverse backgrounds. These methods could also only be realized through electronic means.

As Davis moved into new territory, the labeling of his music would be hotly debated. How should music with little precedent be labeled? Labels and genres are often fraught with baggage and preconceptions as well, and Davis’s later music became a battleground between progressives, jazz purists, critics, and the listening public, exacerbated by the music’s experimental qualities and uneasy relationship to either jazz or rock music, the two sides of the “fusion” coin. Genres or labels are of little use to the present discussion, however.

The following discussion examines several facets of Davis’s work during his electric period. The focus will primarily be on his studio recordings from this time. The lessons gleaned from Davis’s body of work will then be applied to a broader sampling of musicians and their relationships to the technology of the times in which they create.
Prior to this, however, a brief overview of Davis’s early life will prove useful to an understanding of his relationship to sound.

**Miles Davis: Early Life**

Miles Dewey Davis III was born in Alton, Illinois. While still a young child, his family moved to East St. Louis where his father ran a successful dental practice. Davis spent his childhood in East St. Louis enamored with music and sports. The “Harlem Rhythms” radio show, playing the music of Louis Armstrong, Lionel Hampton, Bessie Smith, and Duke Ellington was an early source of musical interest for the young Davis. Davis also had his curiosity piqued after taking childhood trips to Arkansas, visiting his grandfather’s beloved farm and hearing the sounds of local blues and church music. Davis described these sounds as such:

That *kind* of sound in music, that blues, church, back-road funk kind of thing, that southern, Midwestern, rural sound and rhythm. I think it started getting into my blood on them spooky-filled Arkansas back-roads after dark when the owls came out hooting. So when I started taking music lessons I might have already had some idea of what I wanted my music to sound like.”

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5 Davis and Troupe, 28.

6 Davis and Troupe, 29.
This description would be apt for a number of the moody soundscapes Davis would play a role in creating through his music. As writers such as Freeman and Tingen note, the blues would remain an important facet of Davis’s music, even if it often made its appearance mutated or obscured.

Davis received his first trumpet at age thirteen and began his deep relationship with the instrument. His obsession with listening to and figuring out the inner workings of the music he enjoyed drove him through his young years. As he said, “When I got into music I went all the way into music; I didn’t have no time after that for nothing else.” Davis played and studied trumpet at school, but for him the real action was in the East St. Louis nightclub scene, a scene filled with talented jazz musicians and with no shortage of accomplished trumpet players. After graduating high school in 1944, Davis experienced “The greatest feeling I ever had in my life—with my clothes on—…” when he saw Dizzy Gillespie and Charlie “Bird” Parker play in St. Louis. The newness of the music they played, often referred to as be-bop, its energy and intellectualism as filtered through the talents of Gillespie and Parker, created an obsession with Miles Davis. He would chase these sounds down, moving to New York later in 1944 to do so. Upon graduating high school, he traveled to the East Coast, ostensibly to study at Julliard, but with the real intent of looking for Gillespie and Parker and

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7 See Freeman, 14. and Tingen, 85. for example.
8 Davis and Troupe, 31.
9 Ibid., 29.
10 Ibid., 7.
playing the jazz music he loved. In a way, this drive and search for the sound he was enamored with, and the chasing down of the possibilities these new sounds suggested, would define Miles Davis’s entire musical career.

As a young man, Davis made a name for himself playing around New York City. At this time, from the mid to late 1940s into the 1950s, the city was the nexus of the jazz world. It was a scene filled with talented players from around the country pushing one another further and further, creating the sound of jazz as they went along. New York clubs like Minton’s in Harlem and the clubs on 52nd street, known as “The Street” amongst jazz musicians, including the Spotlite, the Three Deuces, Kelly’s Stable, and the Onyx\textsuperscript{11} were the site of jam sessions for musicians whose names today read as a list of the most important and influential musicians in early jazz music. Davis eventually dropped out of Julliard, deciding that what he really came to New York to learn would not be taught in school. He did absorb as much information about music theory and history as he could, and on the advice of Dizzy Gillespie took piano lessons while still attending Julliard. Eventually, Davis decided it was ultimately better to leave the music school:

> When I say that Julliard didn’t help me, what I mean is it didn’t help me as far as helping me understand what I really wanted to play. I figured there wasn’t nothing left for me to do at that school. I have hardly ever felt regret over anything I’ve done. I have sometimes, not often. But I didn’t feel anything when I left Julliard in the fall of 1945. Anyway, I was playing with the greatest jazz musicians in the world, so what did I have to feel bad about? Nothing. And I didn’t. Never looked back.\textsuperscript{12}

\textsuperscript{11} Ibid., 55.

\textsuperscript{12} Ibid., 74.
After college, Davis continued to make a name for himself around New York and elsewhere. He performed and recorded with a number of notable musicians, including Gillespie, Parker, Coleman Hawkins, Thelonious Monk, Freddie Webster, Max Roach, Sonny Rollins, Charles Mingus, John Coltrane, and others. He toured much of the country and spent a significant amount of time playing and living in California during these years. Eventually, Davis had gained enough notoriety and enough skills in composition, arrangement, and group management to lead his own bands.

During the 1950s, Davis recorded his own groups on a handful of jazz-centric record labels such as Prestige before making Columbia Records his home for decades, including the beginning and some of the later part of his electric period. The 1950s saw Davis recording a staggering amount of seminal records, including *Relaxin’ with the Miles Davis Quintet*, *Milestones*, and *Kind of Blue*. These albums have proven influential and groundbreaking, taking Davis and his bands through various styles and ways of making music. The labels hard-bop, post-bop, and modal jazz were all coined during this time to describe the music Davis and a few adventurous others were producing, but as with much of his career these labels had a tenuous connection to Davis’s music and failed to adequately capture what he was doing. He was in fact constantly finding new ways of making and arranging music by following his highly-honed instincts and attempting to realize music he imagined to be the next step in his evolution.

The 1960s saw the emergence of Miles Davis the international jazz superstar. Davis would continue to tour the United States and the world at large,
and record another decade’s worth of groundbreaking albums, including *Sketches of Spain*, *Miles Smiles*, and *Nefertiti*. These run the gamut from highly organized, big-band style arrangements to experimental post-bop with a quintet that borrowed as much from the world of R & B as they did from that of free-jazz. *Nefertiti*, released in January of 1968, would be the last studio album Davis would make featuring only acoustic instruments. Throughout his acoustic period, Davis was still quite experimental in his music making. Experimenting with static tonal centers, modal music, minimal arrangements, pieces where the horns would cycle through melodic material while the rhythm section improvised, fusions of jazz with other styles, and explorations of extended tonalities were all part of Davis’s musical world at this time. The use of electronic instruments would lead to a whole other arena of experimentation, that of sound and texture. These changes in sound and texture along with other technological advances using electricity would also lead to fundamental changes in Davis’s music making process.

It is generally accepted that Davis’s electric period begins in 1967. The significance of 1967 is the recording sessions in December of that year for two new tracks by Davis and his band, “Circle in the Round” and “Water on the Pond.” As Tingen notes: “Circle in the Round’ marks a pivotal moment in Miles’s musical development because it introduces many of the ingredients that would inform Davis’s music until 1975, in particular the musical influences of the ‘60s counterculture, his search for a dense and complex bottom end, and the application of postproduction technology.”

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13 Tingen, 41.
With the 1968 release of *Miles in the Sky*, the first Miles Davis album to feature electronic instruments, a new period of music making for Davis had begun. It would be fully underway by 1969, with the release of the album *In a Silent Way*; an album heralded for its inventiveness and cited as “one of the blueprints for ambient music.”

*In a Silent Way* was also the album where electronics and technological manipulation became essential to what Davis was doing artistically. Davis would slowly and carefully continue to adopt any new methods he felt his music needed, and these happened to be largely reliant on emerging technologies and the possibilities of electric gear and instruments.

By the time electronic instruments were introduced into his music, Davis was in his forties and nearly two decades into an already illustrious career as an artistic trailblazer. Davis often found himself at the forefront of different jazz movements. Whether in the styles of bop, cool jazz, modal jazz, post-bop, or fusion, Davis made some of the most important and influential recordings by taking what had come before and making something new out of it. Tingen sees Davis’s role in several paradigm shifts and new ways of thinking about and making music as coming from his ability to “transcend and include,” a phrase he borrows from philosopher Ken Wilber to show how Davis’s music was continuously able to evolve.

Miles Davis had shown a strong sense of personal vision even as a young musician. His unique, vibrato-less tone and economy of playing brought him attention early on. With his strong artistic conviction and aesthetic sense apparent in his playing.

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14 Ibid., 26.

with Charlie Parker and other group leaders, it is not surprising that Davis would eventually lead his own groups. He was a bandleader from the early 1950s until the end of his career. Assembling bands and leading them was one of his greatest gifts as a musician. Davis picked the strongest musicians to play particular roles for the musical direction he wanted to take, granted they were available. As a bandleader, his approach was to leave the necessary room for the talents he saw in his musicians to not only shine but to flourish beyond what even they thought themselves capable of.\textsuperscript{16}

Miles Davis often pursued approaches to making music that allowed him to be progressively more hands off. To be sure, he could and did work within highly arranged, collaborative settings, such as those between himself and composer and arranger Gil Evans. However, his main interest seemed to be in smaller, flexible bands working with greater autonomy, and this moved him from modal jazz, to post-bop bordering on free-jazz and later into the often-static tonal centers of his electric music. The material his groups worked with changed over time, from full-fledged charts, to skeletal compositions based off a melody or chord progression to music improvised off of grooves or bass lines, to even music made simply by the musicians reacting to gestures or cryptic statements made by Davis through verbal instruction.\textsuperscript{17} The movement of Davis’s music towards less overt structure and more reliance on improvisation and open-endedness was both

\textsuperscript{16} George Grella Jr., \textit{Miles Davis’ Bitches Brew (33 1/3)} (New York: Bloomsbury Academic, 2015), xvi.

\textsuperscript{17} For more information on semiotics and gestures in the music of Miles Davis, see Christopher Smith “A Sense of the Possible: Miles Davis and the Semiotics of Improvised Performance,” \textit{The Drama Review} 39, No. 3 (Autumn, 1995), 41-55.
influenced by and in part made possible due to electronic instruments and new music technologies.

**Electric Instruments**

The metamorphosis of Miles Davis’s music from acoustic to predominately electronic textures began unassumingly enough with the adoption of electric guitars and keyboards. An admiration of contemporary funk, rock, and pop musicians such as Sly Stone, James Brown, and Jimi Hendrix led Davis to see the appeal and possibilities of electric instruments. Davis’s brief marriage to singer Betty Mabry was important in this regard, as the younger singer introduced Davis to the psychedelic music of the late 1960s. Davis says of her “Betty was a big influence on my personal life as well as my musical life… The marriage only lasted about a year, but that year was full of new things and surprises and helped point the way I was to go, both in my music and, in some ways, my lifestyle.”

The 1960s counterculture movement, and a number of its popular, young artists were a direct influence on Davis’s adoption of electric instruments.

Along with trying out electric guitar players in his band, Davis first tentatively started adding in electronic keyboards, instantly changing the sound of his music. By the late 1960s electric keyboards and guitars were popular and, importantly, prevalent among performers and recording studios. From this point on, due to practical reasons of portability and ease of use as well as aesthetic considerations, Davis had his keyboard players play electronic instruments almost exclusively. Electric instruments were not

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18 Davis and Troupe, 290.

19 Tingen, 40.
completely new to jazz, but the context Davis placed them in was. This context was growing further and further away from what many considered jazz to be, but still relied heavily on improvisation and interaction among the musicians. With musicians improvising and playing off of one another, the specific tools they used were bound to play an increasingly important role, especially with Miles’s preferred method at this point of working from extremely skeletal compositions. Placing musicians of the caliber of Herbie Hancock and Chick Corea, for example, on electric keyboards boosted the legitimacy of these instruments immensely to some, but was seen as sacrilege by others. It also allowed for masterful explorations of relatively new sounds.\(^\text{20}\)

Among the first electronic textures included in the music of Miles Davis was the Fender Rhodes piano. Invented by Harold Rhodes in 1942, and later manufactured by the Fender Electric Instrument Company (established in 1946, also responsible for many electric guitars and basses played in Davis’s band),\(^\text{21}\) these keyboards and their distinct, warm tone can be heard on countless recordings spanning half a century, from Duke Ellington’s 1968 “T.G.T.T.” to Radiohead’s 2000 “Everything in its Right Place.” Similar to a piano, the instrument uses keys and hammers, with the hammers striking metal prongs known as tines. This sound is amplified through an electromagnetic pickup, which must be plugged into an amplifier.

Electromagnetic pickups are transducers: devices made to sense and convert mechanical vibrations into an electrical signal. In the case of music, this signal can be

\(^{20}\) Ibid., 39-42.

\(^{21}\) For example, Herbie Hancock and Dave Holland can be seen playing Fender instruments in: *Miles Electric: A Different Kind of Blue*, directed by Murray Lerner (Eagle Rock Entertainment, 2004), DVD.
amplified or recorded directly. This technology allowed for instruments fitted with such
pickups to be electronically manipulated in a number of ways, leading to new
possibilities in tone and volume. Even though this was not the original intent of such
technology, electromagnetic pickup technology had a profound effect on music.²²

The use of electric instruments by Davis’s band members came from both Davis’s explicit instructions and the practical demands of the direction in which he was taking his music. Herbie Hancock was already a renowned pianist by the time he joined Miles Davis’s band, and he initially looked at electric instruments as inferior to their acoustic counterparts. He relates:

“One day I came into the studio and there was no acoustic piano to be seen,” Hancock recalled, “but in the corner was a Fender Rhodes, an instrument I’d never played before. So I asked Miles what he wanted me to play, and he said: ‘Play that!’ I was thinking ‘That toy?’ Oh, okay then…”²³

Keyboardist Keith Jarrett, an important member of Davis’s band who was intermittently present from 1968 until departing in the early 1970s, was also wary of electric keyboards. With Davis, Jarrett played, among other keyboard instruments, both the Fender Rhodes electric piano and the Fender Contempo, a portable, sturdy, and visually striking combo organ. Jarrett can be heard playing the instrument prominently on Davis’s 1971 album *Live-Evil*, with Chick Corea playing the Fender Rhodes. Jarrett did not want to pass up the opportunity to play with the legendary Miles Davis, but he also claimed disdain for the electric keyboards he had to play. Tingen writes “Jarrett… said


²³ Tingen, 39.
that he had been resisting Miles’s invitations to join his band for several years because he
did not want to play electric keyboards again, but that he eventually overruled his
reluctance because he was so keen to play with Miles.” Jarrett also, tellingly, “…would
never play electric keyboards again after his stint with Miles.” 24 Jarrett’s dim view of
electric keyboard instruments was not at all uncommon among jazz musicians during the
1960s, a transitional time for the art form. Davis, in contrast, did not see electronics as a
threat to what he did, but rather as an additional tool. Once swapped out, he refused to
return to acoustic keyboard or bass, and his music would only grow to use more and more
electronic textures.

Davis’s music witnessed an increase in textural density around 1967-1968.
During this time, Davis added multiple electric keyboard players, drummers,
percussionists, and bass players to his recording sessions, while his live groups remained
somewhat leaner but grew louder and more reliant on electronics as well. A key member
of many of Davis’s live and studio bands of the 1960s was bassist Dave Holland, who
came from an R & B, pop, and rock background along with jazz, and was very
comfortable switching from acoustic to electric bass. He cites the increasing density of
the music and the direction this indicated as suggesting the use of electric bass. Davis’s
music from the late 1960s on prominently featured the bass, eventually always electric
bass, in the hands of excellent players such as Holland, Michael Henderson, and Marcus
Miller. 25

24 Ibid., 108.
The use of the wah-wah pedal was also integral to the sound of Miles Davis’s electric bands. A wah-wah pedal is the onomatopoeic name given to a foot-controlled device that filters frequencies, allowing for wide-ranging and fast tonal control with one’s foot. The sound can be heard primarily in rock and funk music. Davis evidently liked the sounds and possibilities of the pedal. He not only used it on his own instrument, therefore bringing his acoustic trumpet into the electronic music realm, but encouraged other band members to use the pedals. This was one case of Davis taking a more hands-on approach with group members. By the mid 1970s, on recordings such as the live-recorded, studio-edited *Agharta* and *Pangea*, band members can be heard utilizing wah-wah pedals simultaneously, creating novel, often chaotic textures (more on this chaos later). Guitarist Reggie Lucas, who played on these recordings, remembers “I played a wah-wah pedal occasionally, but Miles wanted me to play the wah-wah pedal a lot because he was very interested in that sound.”26 This is another example of Davis being influenced by his technological surroundings and then finding new opportunities in them.

It was not until the 1980s that drums and percussion instruments would make a large and economically reasonable move into the electronic realm. Davis took advantage of the possibilities that were offered by these technical advances. Electronic drum sounds became prominent throughout popular music and in the emerging hip-hop scene, a genre whose very existence is intrinsically linked to technology and access to it. Davis again was influenced by these sounds, and he readily included them in his music. Electronic-

26 Ibid., 149.
drum maker Simmons began mass-producing fairly affordable electronic drum kits in the late 1970s up to the early 1990s. Davis was an early adopter of this technology. ²⁷

The Recording Studio

Recording studios themselves were highly influential on much of the music of the 1960s. The studio and the possibilities of recording to magnetic tape had already been exploited by pioneering musicians, artists, and engineers such as Glenn Gould, Joe Meek, Phil Spector, George Martin, and Frank Zappa, but the expectation of honest, live performances being captured with little to no intervening studio-trickery was still the norm in jazz music.

Up until his mid-1970s hiatus, Miles Davis recorded a number of his albums at the famed Columbia 30th Street Studio in New York City. ²⁸ The studio, like many of the day, housed a custom-built mixing console, this one created by engineers working for Columbia Records. Throughout his time working at the 30th Street Studio and Columbia’s other New York City studios, all of Davis’s music was recorded onto tape. While recording on reel-to-reel tape had been experimented with quite early in the twentieth century, German inventors were able to make practical, useable machines to exploit the technology in the 1930s. Tape recorder technology would make great strides in Germany during World War II, as the applications of such technology were numerous and useful during war time. ²⁹

²⁷ Ibid., 224.
²⁸ Ibid., 306-328.
Producer Teo Macero played a crucial role in the development of Miles Davis’s electric music. Macero was often with Davis in the studio and produced or co-produced his albums from 1958-1983. Davis also gave him nearly free reign to edit his studio and live recordings into albums, making Macero an essential collaborator. Macero’s background in European art music, electronic music, recording studio technology, and production went a long way in helping Davis to realize his musical visions. Both men saw technology as a partner and tool in their artistic endeavors.

Post-production, the stage of the production process taking place after the primary recording has occurred, was highly important to Miles Davis’s electric era studio albums. Macero played a large part in this. Having studied at Julliard in the 1940s and 50s and working with composers such as Edgar Varèse afterwards, Macero was privy to the latest in avant-garde and modern art music, experiments in musique concrete, and early electronic music. Some of the new technological possibilities for post-production, many of which Macero introduced to Davis, altered the way Davis worked in the studio. It can also be argued that these possibilities fundamentally shifted the way Davis conceived of making music.30

A key component of post-production, tape editing was extremely important to many of Miles Davis’s live and studio albums. With so much experimentation and improvisation going on within often bare-bones compositions, there was inevitably a sizeable amount of uninspired or unusable recordings. The magnetic tape now used in studios and available in large quantities allowed for the constant recording of sessions

and even live dates, which were later edited down to their best parts, at least in the eyes of the editor.

Added sound effects were also a large part of the post-production process and the creation of new aural landscapes that Davis’s music was coming to rely on. Teo Macero could use echo, such as on the title track to *Bitches Brew*, to make Davis’s trumpet playing sound impossibly large and domineering. This echo came from a machine built by engineers specifically for Macero called the “Teo One Tape Delay.” An extreme example of post-production can be heard applied to John McLaughlin’s guitar playing and Jack DeJohnette’s drumming on the track “Go Ahead John” from the 1974 album *Big Fun*. Teo Macero used new noise-gate technology to create a psychedelic and disorienting effect for the drums and guitar. Noise gates can be set to allow only audio signals of a certain decibel level to be sounded, and Macero combined this effect with panning the drums back and forth between the left and right stereo channels. Using another technique, multiple takes could now be layered atop one another to create an artificial duet between Davis and himself. This is also heard in “Go Ahead John,” where the piece switches to a mid-section blues starting with Davis’s imaginary duet.

After decades of learning, listening, absorbing, and pushing his personal vision forward, the advent and commercial availability of new electronic instruments and music-related technologies in the 1960s provided a new path for Davis to travel. Given the negative reaction many of the musicians Davis worked with initially had when he asked them to switch from acoustic to electric instruments, it is safe to say that Davis had a

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profound sonic influence on the sound of his time well outside of his own music. Herbie Hancock may have initially thought of the Fender Rhodes as a “toy,” but he would go on to play the instrument for decades and make heavily electronic jazz and funk albums for a good portion of his career. This is just one example of many from those who worked with Davis before leading groups of their own.

The genius of Miles Davis, however, lies in his ability to not just be attracted to new sounds and ways of working, but to hear whole new possibilities in them. Many of the jazz-rock fusion bands of the 1970s, many of which contained at least one if not multiple members who cut their teeth working with Davis, featured electronic instruments, yet their music tends to be much more straight forward, less groundbreaking, and less radically structured than Davis’s. A band like Weather Report, for example, led by former Davis keyboardist Joe Zawinul and featuring former Davis saxophonist Wayne Shorter, featured a wealth of electronic keyboard and bass sounds in their music, yet their music is a combination of existing genres, such as jazz and pop, rather than the unclassifiable new sounds on the albums Davis was regularly producing by the 1970s. After examining Davis’s formative years and gaining some background on advances in electronic instruments and recording studios during his time, we can now begin to grasp just how profound an effect electronics had on his music making process by discussing the methods used to create such music and by analyzing theoretically the music resulting from these processes.
Chapter 2

New Methods

In the beginning we knew whether something we played was good or not. Even though we were trying out new things, our approach was still pretty much tied in with a more traditional way of playing. But the more the stuff developed, the harder it became to tell if what we were doing was working or not. For one thing, Miles more and more recorded things in bits and pieces, just little ideas here and there that were later on strung together. It was fascinating to work like that, but during the recording session we couldn’t tell if the stuff was good or bad, or what it was at all. We’d play and then we’d wonder, ‘What was that? What did we do?’

The above quote from Herbie Hancock describes the experimental nature of Miles Davis’s new methods of creating and recording. Coming into the studio with a loose concept, a specifically chosen cast of musicians, and letting the tapes roll and editing them into a new whole: this was the general outline of Davis’s new recording method from the late 1960s until his comeback in the 1980s. It is worth noting that exploring these methods was available due to the technological and financial support afforded him by his record labels: Columbia Records for most of his career, with Warner Brothers being Davis’s home starting in the mid 1980s.

Teo Macero explained to Ian Carr how studio access and tape editing techniques went hand in hand with Davis’s new conception of music making:

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32 Herbie Hancock quoted in Tingen, 47.
The recording machine doesn’t stop at the sessions, they never stop, except only to make the playback. As soon as he gets in there, we start the machines rolling. Everything that’s done in the studio is recorded, so you’ve got a fantastic collection of everything done in the studio. There isn’t one thing missed. Probably, he’s the only artist in the world, since I’ve handled him, where everything is intact…\(^{33}\)

Did the technology of his time suggest to Davis new ways he could work, or were the right tools now available for him to realize a vision he already held? The answer lies in the nexus between these two possibilities, and it points to the nature of interaction between artists and their technological surroundings.

In the 1980s, after a mid 1970s hiatus induced by drugs and numerous health issues, Davis returned to recording and performing music. A new method he began to adopt, alongside his former and once-again collaborator Gil Evans, was the writing of new tunes that were built from melodies improvised by the musicians in Davis’s bands while they were soloing. For example, the track “Star on Cicely” from the 1983 album *Star People* (the last Macero would produce for Davis after decades of collaboration) uses a melody built from a solo played by guitarist Mike Stern at a previous recording date, now played on trumpet and saxophone as the main theme to the tune. The relative ease of recording numerous live and studio sessions and listening back to them inside and outside the studio allowed for this entirely new approach in Davis’s music, an approach again only rendered possible due to electronic technologies. There is a feedback loop between the musicians and technology involved in this process.

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In the 1980s, Davis’s ill health made the conveniences of technology even more valuable to him. During this time, Davis was rarely ever in the studio at the same time as the other musicians on his albums. Instead, after most of the initial recordings had been completed he would come in and overdub his parts. Band members would even call Davis at home and play him music over the phone in order to get feedback. Davis still directed the sessions, but from a distance. Technology allowed him to stay active in the face of illness.  

In another interesting case of technology transforming older concepts, Davis saw synthesizers and multi-track recording as an alternative way to build arrangements in the style of his former collaborator Gil Evans. This would be done by his new collaborators, and Davis would often only come to the studio for the aforementioned recording on top of the other tracks. Davis explained his thought process on the synthetic arrangements as such:

I’m crazy about the way Gil Evans voices his music, so I wanted to get me a Gil Evans sound in a small band… That required an instrument like the synthesizer, which can get all those different instrumental sounds…It was the only thought I had: What can we do to give me a cheap Gil Evans sound in a small band.

An analysis of track lengths in the music of Miles Davis provides further insight into how changing technology affected the temporal aspects of his music. The chart in Figure 1 shows the increased average track length of Davis’s albums as he transitioned from his acoustic to electric period.

34 Tingen, 228-246.
36 Ibid., 247.
Figure 1: Temporal Dimensions in Miles Davis’s Studio Albums\textsuperscript{37}

The chart of Fig. 1 demonstrates that technological advances had a direct effect on the temporal nature of Davis’s music: that is, the tracks became longer. Davis’s status allowed him time in the studio to experiment and to use the facility as a creative tool. This in turn led to exploring music that needs time to unfurl, such as ambient music or group improvisation. Once again, the technology and the music made work together in a feedback loop, with influence going both ways. It may be that Davis wanted to elongate his recordings and now had the means. Or perhaps realizing the potential of the recording studio, he now saw this new path opened up to him for further exploration.

**Theoretical Analysis**

Theoretical analysis of the music Davis made during his electric period raises various specific challenges. The high level of improvisation, lack of traditional melodic and harmonic content, avoidance of functional harmonic relationships, and the use of editing to generate non-traditional forms yields music that does not lend itself to traditional methods of musical analysis. Some of Davis’s more complex and dense recordings are mostly of interest for their timbral, textural and rhythmic qualities. The music, particularly by the 1970s, often sounds like extremely dissonant or electronically adventurous sound masses atop a funky groove. On many of these recordings, there are skeletal yet identifiable themes or motifs combined with sections of improvisation atop specific pitch centers, drum grooves, or basslines. The themes and basslines often dictate the tonal center of the music. The tonal center usually takes the form less of an identifiable key and more of pitchcentricity toward one specific note.
Davis’s recordings are populated with a number of excellent musicians adept at improvising, who often treat the tonal centers in different ways from one another when improvising. For example, when playing over a bassline that suggest pitch centricity to C, a soloist may play notes from a C altered scale, a C blues scale or a C mixolydian scale. The use of various arpeggios can also suggest different tonalities. Using different scales simultaneously and shifting from one to the other is a key element of this music. This is in a way reminiscent of the earlier modal jazz excursions Davis explored on albums such as *Milestones* and *Kind of Blue*, only with a higher degree of chromaticism and dissonance. Davis’s earlier music was never as dense and layered as his electronic music. The amount of different ideas being explored simultaneously by the musicians creates an environment where seemingly any of the twelve available pitches can sound permissible.

As noted, the music made by Davis from the late 1960s to the mid 1970s is primarily texturally and timbraly based. This is mostly due to the use of electronic instruments. As such, analyzing the timbre and texture of the music would be logical. Systems of timbre analysis, such as that proposed by Megan Lavengood, are useful in analyzing individual electronic sounds. However, this way of analyzing sound is not often practical in the case of these recordings. The collective mass of sound is what proves important and defining for each recording. The analysis of individual sounds would also prove impossible without isolating each track from the master recording, and further, the electronic textures constantly shift through the use of either live or post-

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38 Megan L. Lavengood, “A New Approach to the Analysis of Timbre” (PhD diss., The Graduate Center, 2017).
production effects. Analyzing a specific timbre is of no use when an instrument can constantly shift its timbre, through the use of ring modulation, filtering, or a wah-wah pedal, for example. On the other hand, analyzing the overall mass of sound may prove more useful, and a possible path forward on this front will be discussed later on.

With this in mind, I will first examine tracks one and two from *Bitches Brew*, since they are the longest on this seminal album and involve a particularly high degree of editing and post-production work. These two tracks serve as solid examples of the studio improvisation/post-production editing method of music making that makes up a good portion of Davis’s electric period.

Figure 2 on the next page presents a visualization and analysis of the track “Pharaoh’s Dance” from *Bitches Brew*. The visualization displays some of the compositional techniques and editing involved in its construction.

“Pharaoh’s Dance” is the opening track of *Bitches Brew*. The music is highly unsettled, dissonant, and constantly churning, like a cauldron threatening to bubble over. At times, particularly when Davis solos powerfully and pushes his tentative, improvising musicians forward, the music does begin to boil over. The editing of “Pharaoh’s Dance” is circular and disorienting, with sections of music repeated wholesale. The editing process is used to maximize feelings of tension and release, thereby helping to create coherence among the largely improvised material.
Figure 2: “Pharaoh’s Dance” Graphic Analysis

39 Some information on edits was taken from: Grella, 68-74. and Tingen, 312.
As with much of Davis’s electric studio recordings, the material that formed the basis of the group improvisation and the ideas that were the genesis of “Pharaoh’s Dance” are ultimately obscured after all of the post-production work and editing. An early example of this can be found when looking at the composite pieces that became the track “Shhh/Peaceful” from Davis’s previous album and first major electronic statement, *In a Silent Way*. The complete recordings of these sessions reveal that there were main themes and melodies in the piece that do not appear on the final recording. On *The Complete In a Silent Way Sessions* box set, released more than thirty years after the original *In a Silent Way* LP, listeners can hear the main melodic/thematic material excised from “Shhh/Peaceful,” including an opening, winding theme played by the bass and doubled and harmonized by keyboard. One possible transcription of this theme is shown in Figure 3:

**Figure 3: Excised “Shhh/Peaceful” Theme**
This is the most elaborate of the pre-written material excised from “Shhh/Peaceful,” and the shifting meters and complex harmony are even more striking when compared with the vamp that ended up constituting most of the officially released recording, as shown in Figure 4. This simple vamp, a repetitive bassline underlying a D7 harmony, supports the soloists throughout the piece yet one could argue the character and style of the removed theme was essential in influencing the approach taken by the soloists over the vamp section.

**Figure 4: “Shhh/Peaceful” Vamp**

![Vamp notation](image)

Removing the main melodic material from a piece in post-production is not only a bold move but shows Davis to be more interested in other musical parameters such as texture and atmosphere, and the improvisations of the assembled musicians. Finding these excised themes and ideas can be key in discovering how the music of this period came to be. Although certain themes, melodies or riffs may generate the music that followed, since the musicians would then improvise off of these or over the underlying
chord structures, Davis did not feel obligated to include these sections in the final product if the other material produced was of greater interest.

A box set titled *The Complete Bitches Brew Sessions* was released after Davis’s death. Despite this title, however, the set does not actually contain a complete record of the individual recordings used to piece together the material on *Bitches Brew*, and instead largely uses material from different recording sessions around the same time period. This is disappointing, as the “complete” box sets for *In a Silent Way* and *Tribute to Jack Johnson* do actually contain recordings from the sessions that went into the finished project, and as such are quite illuminating. Nonetheless, there are many clues that can be gleaned from the final products on *Bitches Brew*, and in conjunction with a theoretical analysis of the underlying material much can be learned from these recordings.

“Pharaoh’s Dance” begins with a soft opening drum groove and a subtle keyboard riff made up of pitches from the B natural minor scale, focusing more specifically on the notes of the B minor pentatonic scale. The acoustic bass enters further emphasizing the B natural tonality, and is then quickly joined by guitar, bass clarinet and more keyboards. Although there is pitch centricity around B natural, the instruments, particularly the keyboards, quickly make use of each pitch class. The bluesy riffing of some instruments with the chromaticism of others creates a tonal environment where a number of different approaches to improvisation sound permissible, as will be heard throughout the piece once the solos begin.

Prior to this, the music seems to mysteriously spin in circles for several minutes. Through editing, the beginning of the piece is restated at the 1:39 mark, and the whole introduction consists of short segments edited together but in an often seamless and
smooth fashion. Feelings of tension and release are largely achieved through instrumental and timbral density (or lack thereof).

At 3:31 a keyboard riff sounds which moves the pitch centricity toward E natural. At 3:41 Davis takes what is the first proper solo, mainly playing pitches of the E altered scale (E F G Ab Bb C D E). The altered scale is the seventh mode of the melodic minor scale and is also commonly referred to as the “super locrian scale,” as the pitches are that of a locrian scale with the fourth scale degree lowered. It is also known as “the diminished whole-tone scale,” as the scale can be thought of as starting with the diminished scale pattern of alternating half steps and whole steps and concluding with four whole step intervals, like a segment of a whole-tone scale. Alternately, one might regard this as a major scale in which every scale degree other than the tonic is lowered.

In his solo, Davis emphasizes the pitches of G and Ab (G#), which can be thought of as the minor and major third of the central pitch, E. This major/minor third dichotomy evokes the blues, a central part of Davis’s playing, but his emphasis on the pitch C natural, the flat-6 scale degree in the key of E, takes the tonality beyond that of a blues scale, and the augmented fifth interval between the C natural and G# is often exploited to dissonant effect.

Many of Davis’s phrases seem to imply a pull toward C, rather than E, creating further tension against the insistently emphasized E in the bass. The melodic material revolves mostly around the pitches of a C major and C augmented triad. Significantly, later in the piece C will become the central pitch which the musicians play over. Davis also freely uses the pitch B, which—along with the major and minor 3rds above E being sounded—yields phrases with a more traditional blues-solo sound. Davis’s solo is
followed by a bass clarinet solo from Bennie Maupin, during which the music hovers around the tonal center of E, with the bass still emphasizing this pitch and Maupin soloing mainly using notes of the E altered scale and E blues scale (E G A Bb B D). Maupin is joined for some melodic interplay by guitarist John McLaughlin, also soloing using pitches implying either the E Blues or E altered scales.

After these solos, the music simmers down into more group interplay before being interrupted by a new section at 8:31, where the rhythm comes to a halt and a trumpet theme is iterated and quickly repeated through editing. This is followed by repeated micro-edits at 8:50.

The repeated, short segments here last only a brief time. Nevertheless, they are notable as they employ an odd, novel use of a tape editing technique known as looping. Looping is the technique in electronic music of repeating in succession the same section of recorded sound and can be achieved through various means. Looping short segments like this would become common decades later in the age of digital sampling technology, particularly within hip-hop production, when digital music is easily looped or copied and pasted on various pieces of hardware or computer programs. At the time of this recording, however, the technique was not only new but must have been cumbersome to produce. Creating these loops would have required producer Teo Macero to work with tiny segments of magnetic tape that were likely themselves strung together with adhesive tape. Elements such as these loops and the copious amounts of echo on Davis’s trumpet prior to this segment are the production details that take this music beyond being a highlight reel of jazz/rock improvisers and into relatively uncharted territory. The disorienting, mysterious nature of “Pharaoh’s Dance” owes a lot to the piece’s editing
and emphasis on atmosphere, but the material used had to have a starting point, whether it be a vamp, riff, theme, or idea, perhaps even excised from the final product, as was the case with “Shhh/Peaceful.”

In sum, “Pharaoh’s Dance” is a long, unsettling piece of music that finds structural and textural success through the editing process. Just when the music becomes almost unbearably dense, the listener may be transported somewhere else, somewhere relatively less intense, through a segue into other recorded material, often containing the same harmonic or rhythmic backdrop. Reusing prominent earlier material later in the piece through tape editing lends shape, coherence and a sense of intent to the overall piece that would not be present if one simply listened to the unedited sessions used to compile the finished product.

“Pharaoh’s Dance” is followed by the album’s title track, “Bitches Brew.” As the album’s longest piece and one that also heavily relies on post-production editing to bring it to life, it is worth taking a closer look at. Below is a graphic visualization of the piece’s essential moments. Figure 5 presents a graphic depiction of this track’s layout:
Figure 5: “Bitches Brew” Graphic Analysis

VAMP

- MAIN BASS VAMP BEGINS, TUNAL CENTER OF C4
- TRUMPET SOLO
- ENTRANCE OF DRUMS
- GUITAR SOLO
- SUBTLE EDIT

EDIT

- SOPRANO SAX SOLO
- KEYBOARD SOLO, HIGHLY CHROMATIC

VAMP

- TRUMPET SOLO
- GRoup INTERPLAY
- KEYBOARD SOLO/BASS CLARINET RESPONSES
- EDIT/RE-USE OF BEGINNING MATERIAL

THEME:
- BASS + KEYBOARD VAMP ONLY FOLLOWED BY C (MAJ7) ALT.
- CHORDS + TRUMPET RESPONSE
The track “Bitches Brew” consists of two main parts. The first is a theme, albeit a decidedly non-melodic and somewhat strange theme. The second part consists of a vamp section featuring a repeated bassline, a bassline played so repetitively and without variation that it takes on the character of a musical loop. Davis’s penchant for highly repetitive, hypnotic basslines is a key characteristic of his electronic era. It came in part from the influence of other musical genres using electric instruments, such as the electric basslines found in the music of James Brown. Davis may have invited electric bassist Harvey Brooks to these sessions specifically to play this role of ultra-repetitive electric bass player, as he also had the much more accomplished Dave Holland playing acoustic bass at these sessions, and Holland was clearly given the freedom to explore other musical ideas outside of anchoring the group. The timbre of the electric bass and its low register allow it to play repetitive material without being cloying. The use of highly repetitive bass lines is essential to a great deal of electronic music that would come later, and Davis recognized the utility of this compositional technique before most other artists. Rock, R & B, Blues, Soul, and Electronic Dance music all make use of highly repetitive basslines, but this sound previous was largely absent from jazz music.

The “theme” sections of “Bitches Brew” consist of a syncopated, single note riff played on keyboards and bass, which lead into an explosive C min/Maj7 chord accompanied by various, mostly arrhythmic percussion flourishes. Davis’s echo-drenched trumpet interjects before and after these outbursts. This is followed at various times by a figure descending in minor thirds. Figure 6 cites the theme:
This is a skeletal, non-traditional “theme,” but aside from the following vamp it is the only seemingly pre-composed material in the piece. And while this may be an odd theme, it does indeed act as one and, along with the vamp bassline, is structurally essential to the piece and necessary for generating the improvisatory material surrounding it.

Figure 7 presents the bassline for the vamp sections of “Bitches Brew”:

**Figure 6: “Bitches Brew” Theme**

**Figure 7: “Bitches Brew” Vamp Bassline**
This bassline repeats, with virtually no variation, throughout the vamp sections, providing the main harmonic background for the soloists to play over in these sections. The bassline renders C natural as the central pitch. This is achieved through the stressing of C on beat 1 of the vamp, the presence of the leading tone B natural, and the G to C (scale degree 5 to 1) movement that restarts each iteration of the bassline. These are elements of functional harmony that drive tonicization, but within a decidedly non-functional harmonic context. There are no traditional chord progressions within the piece’s entire 27:01 run-time. The vamp section implies a tonality similar to that of the earlier theme sections. Much like “Pharaoh’s Dance,” the musicians each treat the tonal center differently and use a variety of modes to solo and improvise throughout.
Chapter 3

Recordings as Aural Landscapes

The view of audio recordings as an imaginary aural landscape is no longer new, so it is easy to take for granted how important this paradigm shift in the perception of recordings is to music history. At first largely viewed as a means to capture a live musical event as accurately as possible, recorded artifacts suggested new possibilities to many creative thinkers. As early as the 1940s, forward thinking musicians were hearing new possibilities suggested by new technologies. The conductor Leopold Stokowski, a proponent of recorded music at a time when many musicians were still quite skeptical of the medium, states in his book *Music for All of Us*, “The first step is to make music exactly like the original. The next step is to surpass the original and, through future possibilities of recording, to achieve the dreams of musicians – of making still more beautiful and eloquent – music they heard within themselves but which was unattainable in the past.”

By the time of Davis’s electric period, creative artists such as Brian Wilson, Mort Garson, Wendy Carlos, and others saw technology as allowing for something else, something new, in the realm of recorded sound. Davis recognized this as well.

Sound isolation, advances in microphone technology, stereo recording, and the ever-increasing availability of individual tracks in the recording studio first suggested to record producers ways of making imaginary aural landscapes. In other words, the end result was not an approximation of how the music sounded “in the room.” It could have possibly been produced in many rooms, in different countries, by a group of musicians over any period of time or by one musician multi-tracking themselves. The potential of such technological advancement was fulfilled early on by artists such as Raymond Scott, Bruce Haak, and Todd Rundgren who recorded albums largely or entirely by themselves.\(^{41}\) The stereo spectrum had suddenly become something of a canvas for artists to exploit. This paradigm shift in turn led to technological advances and an economy that facilitated it. Better tools to close-mic, isolate, and alter individual sounds have become increasingly prominent since.\(^{42}\)

By the late 1960s, massively popular albums such as The Beatles’ *Sgt. Peppers Lonely Hearts Club Band*, Jimi Hendrix’s *Electric Lady Land*, and others were exploiting the concept of creating illusory environments in an audio recording. Almost all of Davis’s albums from 1969 to 1975 can be viewed this way, as these albums were particularly abstract and genre-less and focused on their overall soundscape in the general absence of predetermined structure, harmonic progression, or melodic content.

A particularly useful tool in creating illusory landscapes within the stereo spectrum is what is commonly referred to as direct-in or line-in recording.

\(^{41}\) See, for instance, Scott’s *Manhattan Research Inc.*, Haak’s *The Electric Lucifer*, and Todd Rundgren’s *Something/Anything?*, recorded largely or entirely by the artists themselves using overdubbing.

\(^{42}\) See discussion in Mumma, "Recording".
Davis and Macero sometimes used this method for recording, leaving them with greater control over individual instruments when constructing their aural landscapes. Direct-in recording derives its name from the way in which this recording process takes place. Electric instruments generally need to be amplified in order to be heard. Power cables are used to send an electric signal from the instrument to an amplifier. In some cases, this signal can be fed directly into the recording console rather than an amplifier.

Recording instruments with the direct-in or line-in method allows for a great deal of control over these sounds in post-production. Since this method eschews the use of microphones, there is generally little to no extraneous sound in the signal, and none of the ambient room sound that can be picked up by microphones. This leads to what is commonly referred to as a dry signal. Where microphones would pick up other instruments and sounds from the environment and make the complete separation of sounds impossible, direct-in recording allows for greater individual manipulation of each sound. This allows producers and engineers to shape and sculpt recorded sounds through several means, including moving them anywhere that may be desired along the stereo spectrum, placing reverb, modulation, or other effects on them after the recording has taken place while not affecting the other sounds, fading instruments individually in and out of a mix, and generally creating sound events that are fictitious in the sense that the final recording is not a sound event that ever happened in the real world. Post-production has played an important role in the recording process almost since its inception, and the use of direct-in recording allows for greater control of almost all aspects of the recorded signal.
The results of this process, much like that of recording using microphones, vary greatly. This method was particularly prevalent in the popular music of the 1980s, and along with other technological advances of the time is heavily responsible for what is often referred to as the “80s” sound. This is yet another example of how technology can not only change the way music is recorded but can also change the way in which artists conceive of making recorded artifacts. There are artists today who utilize or prefer the aesthetic of direct-in recording, either exclusively or in conjunction with microphones. The great expansion of home recording studios and affordable recording equipment has made the direct-in method quite practical in the absences of expensive microphones or the proper facilities in which to record with microphones.

Direct-in recording is particularly useful for creating an illusory aural landscape. Without capturing the sound of musicians in a room, it is in fact up to producers, engineers and recording artists to create this landscape. Facing this proposition, they can either choose to emulate earlier recording processes and produce a fake facsimile of a live performance, use the opportunity to create something completely synthetic and otherwise unachievable, or choose an aesthetic somewhere between these poles.

In Running the Voodoo Down, Philip Freeman discusses another way in which this method affected the recording of the album On the Corner. Saxophonist Dave Liebman was called and asked to join an already in progress recording sessions for what would become Davis’s 1972 album On the Corner. Several musicians were already playing, and with the keyboards unamplified and plugged directly into the recording console Liebman could not hear what they were playing without headphones, of which there were no more pairs available. Davis indicated for Liebman to approach the
microphone and play anyway, with the saxophonist only able to hear the percussionists, who were not using electronic instruments, and the “keyboardists’ fingers clacking” on the keys of their electric instruments. The resultant solo is the first heard on the album.43

By the time of Miles Davis’s recordings in the 1980s, direct-in recording was in heavy use, but when used during the sessions for On the Corner in 1972 this method had yet to develop into a full-blown aesthetic. Going beyond even the heavy tape editing of earlier albums, On the Corner utilizes tape editing, direct-in recording, post-production effects, and other methods available to Davis and Macero in order to create something new. Perhaps part of the reason for the hostile reaction to the album was due to Davis and Macero’s use of these methods to create an aural landscape unlike any heard before, in which instruments and sounds float in and out of the mix in a way that live performance does not allow for.

In a traditional musical sense, very little actually happens throughout each of On the Corner’s four tracks. There are virtually no chord progressions and the bass lines and rhythmic figures are even more repetitive than on previous albums, almost maddeningly repetitive if one focuses their attention solely on these aspects of the music. However, if one attunes their ears to the endless textural variety and the sounds that come in and out of the corners of the mix there is indeed much going on in this music. This method of textural music making was perhaps the reason On the Corner proved so polarizing and

43 Freeman, 98.
elicited strong negative reactions upon its release, but is today considered quite revolutionary and a favorite among Davis’s more adventurous listeners.\(^{44}\)

Davis’s 1974 album *Get Up With It* is also of particular note to the topic of aural landscapes. A compilation of material recorded at various sessions between 1970 and 1974, *Get Up With It* features extensive post-production manipulation throughout its eight tracks, and in quite a number of varied ways. For example, the album opens with the Duke Ellington tribute “He Loved Him Madly,” an expansive, more than half-hour long piece that seemingly revels in its slow pace and hazy atmosphere. The piece relies heavily on post-production, with whole sections of recordings being repeated throughout and parts of the music not originally recorded sequentially seamlessly transitioning from one to another. “He Loved Him Madly” is remarkable enough in and of itself to have many words devoted to it. Freeman does so in his analysis of the piece, and also notes that ambient music pioneer Brian Eno specifically cites this piece as “a primary influence on the development of ambient music.”\(^ {45}\)

The hazy, slowly developing atmosphere of “He Loved Him Madly” is contrasted greatly by another track from *Get Up With It*, the relentlessly dissonant “Rated X.” On “Rated X,” Davis overdubbed a Yamaha YC45 electronic organ, dense clusters of which were created with tape loops.\(^ {46}\) Via post production editing, Macero lays these clusters on top of Davis’s band as they play, and at times drops all of the instruments out except for

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\(^{44}\) Ibid., 97-112. Freeman devotes an entire chapter in his book to the recording of *On the Corner* and the strong reactions the album elicited from listeners at the time of its release.

\(^{45}\) Ibid., 94-96.

\(^{46}\) Tingen, 133 and 325.
the organ. This is an odd technique in and of itself for the time and is perhaps more akin to something that would be heard in the dub reggae productions of King Tubby or in the electronic Jungle, Drum n’ Bass, or Hip-Hop music of the 1990s. The dropping out of the entire band combined with the highly dissonant electronic organ clusters creates what is some of Davis’s most alienating music, an aural landscape that sounds more like a psychedelic warzone than a slow-moving reverie. The polar extremes of “He Loved Him Madly” and “Rated X” demonstrate just how profoundly and quickly electronics were suggesting new ways of music making to Davis.

The concept of music acting as an aural landscape, and the composition and production of music evocative enough to invoke a listener’s other senses and play with their sense of space and time predates Davis, and even predates recorded music. The advent of recording and subsequent advances in post-production processes, special effects, and stereo recording contributed greatly to this idea. These tools needed the proper creative personnel in order to be fully exploited, and Davis and Macero were a duo particularly well-suited for such explorations. The variety of the music they produced together speaks to a rapid realization and utilization of the recording studio to create new, illusory music performances. In many ways, the processes they utilized in the studio were more akin to sculpting or painting with sound than they were to traditional music performance.

**Unintended Consequences**

The use of electronic equipment can have unintended consequences on music, sometimes undesirable and sometimes serendipitous. Over time, issues with equipment such as feedback and distortion actually became desirable to some, and what was once a
limitation of the electronic equipment can now be used as a creative tool. The knowledge required to operate machinery has led to creative misuses and discoveries within the learning process. It is often the case that the technological limitations of an era come to define its sound, and the history of recorded music points to such instances.

The feedback loop between music and technology is often unintentional. For example, many early electric guitarists cranked the volume and gain on their amplifiers and found they actually liked the distorted sound produced when the tube amplifiers were pushed to their limits. Today, amplifiers using digital technology come with a number of tube distortion replicating effects built into them. These sounds are available at the push of a button, and they have become standardized in guitar-based music.

Keyboardist Chick Corea points out one interesting, likely unintended consequence of moving to electronic instruments in a live setting. For a brief time, both he and Keith Jarrett were playing electric keyboards in Davis’s live band. As many performing musicians can relate, the sound on stage could leave much to be desired. Corea recalls “…when Keith and I played live, there really was no communication. Miles put either keyboard on each end of the stage and I could never hear what Keith was playing and I doubt Keith ever heard a note I was playing. So it was hard to really play something together.”47 This gives rise to two musicians playing blindly with or against one another and inadvertently creating a new way of making music, as a sort of blind collaboration. With Davis’ preferred working method of keeping his musicians in the dark and using increasingly less structured compositions, he may have even desired this

47 Ibid., 117.
effect. It certainly provides an example of how electricity was and still is further shaping music, even suggesting a new way of playing for those who would view it that way and not simply as a shortcoming. Musicians have to react to what they are limited to hearing on stage, which is often an odd mix that does not sound the same as what is coming from the main P.A. system, and they must make musical decisions on how to act accordingly. The idea of playing blindly can then be brought into the studio, and indeed was used by bassists Jaco Pastorius on “Crisis,” the opening track of his 1981 album *Word of Mouth.*

The re-appropriation, misuse, or unwieldy-nature of electronic equipment can lead to a chaotic soundscape. While it is safe to assume that chaos would be an undesirable characteristic in most styles of music and to most listeners, it became an incredibly fertile and exciting part of Davis’s music. This is particularly true of the live albums *Agharta* and *Pangaea,* where more electronic gear was incorporated into Davis’s live band than ever before. Both albums document Davis’s band just prior to his late 1970s hiatus, and were recorded on the same day, February 1, 1975. *Agharta* and *Pangaea* document an afternoon and evening show, respectively, and each contain a maelstrom of electronic sounds and textures that at times sound like the genesis of the “noise” music genre, represented by diverse artists such as Merzbow and Wolf Eyes. Within these electronic textures lurked unforeseen possibilities.

48 *Jaco,* directed by Stephen Kijak and Paul Marchand (Iron Horse Entertainment, 2015), DVD.
The Edge of Chaos

David Borgo discusses chaos theory in relation to music in the way modern scientists tend to view the subject—that is, not as complete, unknowable randomness, but instead as a complex system:

Modern science has traditionally sought to take complex systems apart in order to discover their fundamental parts; for instance, to discover the smallest building blocks of matter, or more recently the makeup of the human genome. Reductionism has been enormously successful in helping to explain how complex things are made up of lots of simpler things. But it cannot, by itself, answer important questions regarding how things interact in complex ways to produce striking simplicities; the simplicities of form, function, and behavior.\textsuperscript{49}

In \textit{Sync or Swarm}, Borgo demonstrates the relationship between freely improvised music and complex systems, where unforeseen results and relationships arise constantly. The rhythm sections of Davis’s live band, particularly in 1969 and 1970, would often veer into “free” territory, with no predetermined structure underlying the music. The later \textit{Agharta} and \textit{Pangaea} albums contain overlapping layers and at times a relentless onslaught of electronic sounds. The musicians pick up on threads introduced by one another and new relationships are formed in the maelstrom, which can then give rise to entirely new, unplanned sections of music. Although Davis was wary of veering off into totally free jazz territory, he occasionally allowed his bands to.\textsuperscript{50} Even when the


\textsuperscript{50} Davis and Troupe, 250-251 and 271-272. These are just some of the examples in his autobiography of Davis expressing a wariness toward the “free thing” happening in Jazz music around the mid 1960s.
music was not fully free of structure, the material the group was playing from was often left sparse in order to leave maximum room for improvisation and interaction, letting all sorts of new relationships arise. This is apparent when looking at the previous theoretical analyses. While the reliance on skeletal composition to spur improvisation is also part of Davis’s acoustic post-bop era, electronics amplified the complexity of the overall soundscape considerably.

In Miles Beyond, Tingen describes one such instance of musical chaos involving electronics. Davis gave guitarist Pete Cosey and percussionist Mtume an EMS Synthi A portable synthesizer and a Yamaha brand drum machine, respectively, to experiment with live on stage. Tingen states that “another striking aspect of Agharta, as well as Pangae, is the interplay of the abstract noises from Cosey’s EMS Synthi A synthesizer, and, rather surprisingly, Mtume’s Yamaha drum machine.”

Mtume describes the situation as such:

Our tours of Japan were sponsored by Yamaha… they gave Miles their first drum machine. Miles handed it to me, saying. ‘See what you can do with it.’ We were in experimental mode, so instead of using it to create rhythm, I wanted to see whether I could use it to create texture. I played it through six or seven different pedals, phase shifters, wah-wah, and biphase mutrons and so on, while pressing down three or four rhythms at the same time. I’m using a volume pedal, so I’m bringing the sound in and out. It was total tapestry.

By integrating unfamiliar electronics, Miles Davis was actively courting chaos and its possibilities.

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51 Tingen, 165.
52 Ibid., 165.
While it does not apply to a lot of his music, chaos theory is a useful lens to view some of Davis’s electric era, as mentioned above. We have also seen that some of Davis’s electronic music can be quite difficult to analyze through traditional methods, and that some of these methods may not yield much useful information since much of the music is reliant on changes of texture and timbre rather than harmonic progression or motivic development. Borgo applies methods of analyzing complex systems to music, and perhaps this path would be useful if applied to Davis’s music.

**Miles’s Methods: Modern Applications**

Miles Davis’s career provides us with a rare view of an artist, already legendary as an acoustic musician, absorbing the rapidly changing advances in technology around him. Davis’s work has shown that adopting new technology and methods can lead to not only new sounds but entirely new ways of conceiving of music and music making. In the age of humans harnessing electrical energy, how has technology shaped music making since Davis?

With electrical energy as a foundation, computer technology, MIDI connectivity, digital audio workstations, Internet connections, and increased communication speeds between electronic devices have risen up to play major roles in shaping modern music and art. Davis’s blurring of genres and his inclusion of elements outside of jazz tradition were nothing short of blasphemous to a number of jazz artists. Among the naysayers were well known musicians such as Wynton Marsalis and writers such as Stanley

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53 Freeman, 162. According to Freeman, Wynton Marsalis told *Jazz Times* magazine “Miles was never my idol, I resent what he’s doing because it gives the whole scene such a let-down... I think Bird would roll over in his grave if he knew what was going on...”
Crouch,54 who criticized Davis both personally and for his forays outside of traditional jazz once he went electric.

For many modern musicians outside of the Western art music tradition, there has been almost a reversal of expectations in regard to genre. An artist who stays steadfastly in one genre might be more out of place today than one who does not. There is a clear connection between this notion and the relative ease of access to information and media in the twenty-first century, but also a connection with the ever more prominent influence and adoption of new technologies to musical ends.

The rise of digital audio workstations, or DAWs, has had a profound effect on modern music making. Fairly advanced programs can be downloaded for free, purchased cheaply, or come installed on consumer computers. Most are easy to use and technologically advanced compared to older recording methods, suggesting to even non-musicians that making music is no longer an elite activity but is available for the masses. Digital files can easily be exported and shared, and musicians have used DAWs and multi-track recording to work on music together while being geographically separated. The movement of digital tracks and files is much easier than moving physical reels of fragile tape. Arguments over digital vs. analogue sound quality abound, but there are some definite advantages to the adoption of the latest electronic advances.

54For one example, see:
We might wonder: how do these DAWs affect the creation and process of music making, consciously or unconsciously? One unforeseen effect is noted by Brian Eno, who notes how the proliferation of DAWs has led to a generation of popular music that is very much “in the grid period of making music.”\textsuperscript{55} With this, Eno refers to the way in which, confronted with a visualization of the musical project on a computer, many tend to stick with the grid-oriented, rhythmically subdivided displays used by most DAWs. The visual aspect of the workstation may influence the music made on it. Quantizing, copying and pasting entire sections of music, and large-scale structural reorganization are all easy to achieve with digitally recorded music, a far cry from the time-consuming process of cutting up tape with a razorblade and putting the pieces together. The implications of this may be a generation dominated by rhythmically precise music that features little interaction and dialogue amongst musicians, higher degrees of repetition, and a favoring of genres with these characteristics by electronic musicians.

There can be countless unforeseen consequences as well. What might Miles Davis have done if he had a DAW in his home? Would Davis lament the decline in live, in-studio performance recordings, which are harder, costlier and more time consuming to arrange but allow for the interaction among musicians he felt was essential to music making? His work in the 1980s suggests that he would welcome this direction, but it is important to consider his ill health as a major factor in embracing long distance collaboration.

A number of artists today take advantage of innovations made by Miles Davis and his collaborators, whether they are aware of this or not. The method of recording large expanses of improvised music and editing them into a finished whole is adopted by many different musicians. Recording technology is now readily available in a myriad of forms, from tape machines to computers to smartphones. American musicians James Ferraro and Spencer Clark, comprising the duo The Skaters before going on to prolific solo careers, are two examples of how technology and the innovations of our musical forebears afford artists many different ways of approaching recording. This in turn can lead to chameleon-like artists who switch methods, equipment, and genres from project to project, particularly in the case of Ferraro.

My own band, the New York based Glen and the Boys, is among several that have applied recording techniques used by Miles Davis in the making of over 200 albums. Group improvisations are often edited, rearranged, and equalized from hours of recorded material to make albums, and much of the band’s live material consist of songs written by fleshing out ideas from these improvised recordings. Because of technology, an improvised idea can be listened back to and utilized, much as Davis had done in the 1980s, further showing the feedback loop between musicians and their surrounding technology.

Freeman details a number of other disciples of Davis’s electric period, such as New York band Burnt Sugar and trumpeter Tim Hagans. My own firsthand experience with Davis’s influential methods is one reason I understand their profound importance.

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56 Freeman, 207-221.
Whether influenced directly or not, these artists and many other of today’s mavericks of recorded music can trace what they do back to the work of Miles Davis.

**In Conclusion**

Guitarist Reggie Lucas, who played with Davis in the 1970s and co-produced Madonna’s self-titled, heavily electronic 1983 debut album, sums up the restless creativity of Miles Davis quite well:

Miles’s personality and his music challenge one to think and to reevaluate one’s basic conceptions of what life is and how it’s to be lived, what music is and how it’s to be created. That’s difficult for some people. They like terra firma. They’re threatened by change. Their goal in life is to create as much definiteness, irrespective of how much mediocrity they have to embrace in order to achieve it. Miles was the enemy of this. His goal was to create individuality and innovative expression at any time that he could. He was most contemptuous of artistic complacency and mediocrity.\(^{57}\)

Given the cultural and political context of Miles Davis’s electric period, from the tumult and rapid change beginning in the late 1960s through the electronic music revolution of the 1980s, it would be more surprising if an artist as restless and searching as Davis did not absorb contemporary inventions and discoveries into his art. His strong artistic vision, realized alongside some of the world’s top musicians, assured most of the music did not devolve into uninteresting explorations of new textures, nor does most of the music sound dated or lifeless to modern audiences. Davis thoughtfully included more

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\(^{57}\) Tingen, 268.
and more electronic textures, which shaped the music in a number of intentional and unintentional ways.
Bibliography


Lavengood, Megan L. A New Approach to the Analysis of Timbre, 2017, The Graduate Center, All Graduate Work by Year: Dissertations, Theses, and Capstone Projects.


Discography

The following are discographies for Miles Davis’s pre-electric period studio albums, Miles Davis’s electric period studio and live albums, and works by other musicians mentioned in the above text. Information regarding Davis’s electric period discography is heavily informed by Enrico Merlin’s discography appearing in Paul Tingen’s book *Miles Beyond: Electric Explorations of Miles Davis*. The following discographies are comprehensive but not exhaustive, and do not cover bootlegs, unofficial releases, and some releases on non-traditional formats such as laser-disc. Miles Davis’s albums are listed chronologically by release date, and not by the time at which they were recorded. Songs and albums by other artists are listed in the order in which they appear in the text. In the case of songs, the albums they appear on can also be found. In the case of artists mentioned without reference to a specific piece, song, or album, a representative album is listed. In all sections the year of release and the record label on which the music was released are next to each entry.

Miles Davis’s Pre-Electric Period (1951-1968)

2. *Young Man With a Horn* (1952, Blue Note)
3. *Blue Period* (1953, Prestige)
4. *The Compositions of Al Cohn* (1953, Prestige)
5. *Miles Davis Volume 2* (1953, Blue Note)
6. *Miles Davis Volume 3* (1954, Blue Note)
7. *Miles Davis Quartet* (1954, Prestige)
8. *Miles Davis All-Star Sextet* (1954, Prestige)
9. *Miles Davis Quintet* (1954, Prestige)
10. *Miles Davis with Sonny Rollins* (1954, Prestige)
11. *Miles Davis All-Stars Volume 1* (1955, Prestige)
12. *Miles Davis All-Stars Volume 2* (1955, Prestige)
13. *Musings of Miles* (1955, Prestige)
15. *Dig* (1956, Prestige)
16. *Miles: The New Miles Davis Quintet* (1956, Prestige)
17. *Miles Davis and Horns* (1956, Prestige)
18. *Quintet/Sextet* (1956, Prestige)
19. *Collector’s Items* (1956, Prestige)
20. *Blue Haze* (1956, Prestige)
22. *Cookin’* (1957, Prestige)
23. *Bags’ Groove* (1957, Prestige)
24. *'Round About Midnight* (1957, Columbia)
25. *Miles Ahead* (1957, Columbia)
27. *Mile-Stones* (1958, Columbia)
28. *Jazz Track* (1958, Columbia)
29. *Miles Davis and the Modern Jazz Giants* (1959, Prestige)
30. *Workin’* (1959, Prestige)
31. *Porgy and Bess* (1959, Columbia)
32. *Kind of Blue* (1959, Columbia)
33. *Sketches of Spain* (1960, Columbia)
34. *Someday My Prince Will Come* (1961, Columbia)
35. *Steamin’* (1961, Prestige)
36. *Quiet Nights* (with Gil Evans) (1963, Columbia)
37. *Seven Steps to Heaven* (1963, Columbia)
38. *E.S.P.* (1965, Columbia)
40. *Sorcerer* (1967, Columbia)
41. *Nefertiti* (1967, Columbia)

**Miles Davis Electric Period (1969-1992)**

1. *Miles in the Sky* (1968, Columbia) *features some electric instruments but pre-dates the use of electric period recording techniques
2. *Filles de Kilimanjaro* (1968, Columbia) *features some electric instruments but pre-dates the use of electric period recording techniques
3. *In a Silent Way* (1969, Columbia)
5. *At Filmore: Live at the Filmore East* (1970, Columbia/Legacy)
8. *On the Corner* (1972, Columbia)
9. *Black Beauty: Miles Davis at Filmore West* (1973, Columbia/Legacy)
10. *Miles Davis in Concert: Live at Philharmonic Hall* (1973, Columbia)
11. *Big Fun* (1974, Columbia)
13. *Agharta* (1975, Columbia)
15. *Water Babies* (1976, Columbia) *released during the electric period but recorded prior to it in 1967 and 1968
18. *The Man with the Horn* (1981, Columbia)
25. Isle of Wight (1987, CBS)
31. Miles! Miles! Miles!- Live in Japan ‘81 (1993, Sony)
33. The Complete Bitches Brew Sessions (1998, Columbia)

Other Artists/Recordings Cited

1. Betty Davis (nee Mabry) Betty Davis (1973, Just Sunshine)
3. Radiohead “Everything in its Right Place” from Kid A (2000, Capitol)
4. James Brown In the Jungle Groove (1986, Polydor)
5. Brian Wilson with the Beach Boys Pet Sounds (1966, Capitol)
7. Wendy Carlos Sonic Seasonings (1972, Columbia)
10. Todd Rundgren Something/Anything? (1972, Bearsville)
12. Jimi Hendrix Electric Lady Land (1968, Reprise)
18. Spencer Clark (as Monopoly Child Star Searchers) *Bamboo for Two* (2009, Pacific City Sound Visions)
22. Tim Hagans *No Words* (1994, Blue Note)